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No contribution reaching the Editor later than 10th December next can appear in the January Number of MIND.

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NEW SERIES. No. 108. OCTOBER, 1918.

NOV 27 1918

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MIND

A QUARTERLY REVIEW

OF

PSYCHOLOGY AND PHILOSOPHY.

EDITED BY

PROF. G. F. STOUT,

WITH THE CO-OPERATION OF PROFESSOR E. B. TITCHENER, AMERICAN EDITORIAL REPRESENTATIVE, AND OF PROFESSOR WARD, PROFESSOR PRINGLE-PATTISON, DAVID MORRISON, M.A., AND OTHER MEMBERS OF AN ADVISORY COMMITTEE.

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PUBLISHED FOR THE MIND ASSOCIATION BY

MACMILLAN & CO., LIMITED,

ST. MARTIN'S STREET, LONDON, W.C. 2.

NEW YORK: THE MACMILLAN COMPANY.

Price Four Shillings.

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NEW SERIES. No. 108.] [OCTOBER, 1918.

MIND

A QUARTERLY REVIEW

OF

PSYCHOLOGY AND PHILOSOPHY

I.—ON THE RELATION BETWEEN INDUCTION AND PROBABILITY—(Part I.).

BY C. D. BROAD.

IN the present paper I propose to try to prove three points, which, if they can be established, are of great importance to the logic of inductive inference. They are (1) that *unless* inductive conclusions be expressed in terms of probability all inductive inference involves a formal fallacy; (2) that the degree of belief which we actually attach to the conclusions of well-established inductions cannot be justified by any known principle of probability, unless some further premise about the physical world be assumed; and (3) that it is extremely difficult to state this premise so that it shall be at once plausible and non-tautologous. I believe that the first two points can be rigorously established without entering in detail into the difficult problem of what it is that probability-fractions actually measure. The third point is more doubtful, and I do not profess to have reached at present any satisfactory view about it.

1.

All inductions, however advanced and complicated they may be, ultimately rest on induction by simple enumeration or on the use of the hypothetical method. We shall see at a later stage the precise connexion between these two methods. In the meanwhile it is sufficient for us to notice that, whilst the inductions of all advanced sciences make great use of deduction, they can never be reduced without

residue to that process. In working out the consequences of a scientific hypothesis many natural laws are assumed as already established and much purely deductive reasoning is used. But the evidence for the assumed laws will itself be ultimately inductive, and the use which is made of our deduced conclusions to establish the hypotheses by their agreement with observable facts involves an inductive argument.

Now both induction by simple enumeration and the hypothetical method involve, on the face of them, formal fallacies. The type of argument in the first kind of induction is: All observed S's have been P, therefore all S's whatever will be P. Now the observed S's are not known to be all the S's (indeed they are generally believed not to be all the S's). Hence we are arguing from a premise about *some* S's to a conclusion about *all* S's, and are clearly committing an illicit process of S.

Most inductive logicians of course recognise this fact, but most of them seem to suppose that the fallacy can be avoided by the introduction of an additional premise which they call the Uniformity of Nature or the Law of Causation. They admit that there is a difficulty in stating this principle satisfactorily and in deciding on the nature of the evidence for it, but they seem to feel no doubt that *if* it could be satisfactorily stated and established the apparent formal fallacy in induction by simple enumeration would vanish. It is easy, however, to show that this is a complete mistake. Whatever the supposed principle may be, and however it may be established, it cannot be stronger than an universal proposition. But if an universal proposition be added to our premise, All observed S's are P, the latter premise still remains particular as regards S. And from a universal and a particular premise no universal conclusion can be drawn.

It follows then that no additional premise, whether about logic or about nature, can save induction by simple enumeration from a formal fallacy, so long as the conclusion is in the form all S's are P. If the validity of the process is to be saved at all it can only be saved by modifying the conclusion. It remains of course perfectly possible that some additional premise about nature is *necessary* to justify induction; but it is certain that no such premise is *sufficient* to justify it.

The hypothetical method equally involves, on the face of it, a formal fallacy. The general form of the argument here is: If h be true then c_1, c_2 . . . c_n must be true. But c_1, c_2 . . . c_n are all found by observation to be true, hence h is true. This argument of course commits the formal fallacy of asserting the consequent in a hypothetical syl-

logism. The only additional premise which could validate such an argument would be the proposition: h is the only possible hypothesis which implies $c_1, c_2 \ldots c_n$. But this proposition is never known to be true and is generally known to be false.

The conclusions of inductive argument must therefore be modified, and the most reasonable modification to make is to state them in terms of probability. The advantages of such a course are (*a*) that this accords with what we actually believe when we reflect. We always admit that the opposite of an inductive conclusion remains possible; even when we *say* that such conclusions are certain we only mean that they are so probable that for all practical purposes we can act as if they were certain. That this differs from genuine certainty may be seen if we reflect on the difference in our attitude towards the true propositions, All grass is green and $2 \times 2 = 4$. In ordinary language both would be called 'certain,' but our attitudes towards the two are quite different. No one would care to assert that there might not be in some part of space or time something answering to our definition of grass but having a blue instead of a green colour.

(*b*) With the suggested modification of our conclusion the logical difficulty vanishes. Suppose the conclusion becomes: It is highly probable on the observed data that all S's are P. There is then no illicit process. We argue from a *certain proposition* about *some* S's to the *probability* of a proposition about *all* S's. This is perfectly legitimate. The subject of our conclusion is no longer All S's, but is the proposition All S's are P. The predicate is no longer P, but is the complex predicate 'highly probable with respect to the observed data'.

(*c*) If inductions with their unmodified conclusions were valid forms of inference we should be faced by a strange paradox which furnishes an additional proof that inductive conclusions must be modified. It is often certain that all the observed S's are P. Now what follows from a certain premise by a valid process of reasoning can be asserted by itself as true. Yet we know quite well that, if the conclusion of an inductive argument be All S's are P, the very next observation that we make may prove this conclusion to be false. Hence we have the paradox that, if induction be valid and the conclusion be All S is P, a *certain* premise and a *valid* argument may lead to a *false* conclusion. This paradox is removed if we modify our conclusion to the form: It is highly probable on the observed data that all S is P. Probability and truth-value are both attributes of propositions.

I omit here further subtleties as to whether they do not more properly belong to propositional forms, or, as Russell calls them, functions.) But they are very different attributes. (i.) A proposition is true or false in itself and without regard to its relations to other propositions; a proposition only has probability with respect to others, and it has different probabilities with respect to different sets of data. (ii.) A proposition which is very probable with respect to certain data may be in fact false, and conversely. This is precisely what we mean by 'a strange coincidence'. It follows from these facts that if I have observed n S's and they were all P it may be highly probable relative to these data that all S's are P, and yet it may be false that all S is P. If I observe an $n + 1$th S and it proves not to be P, I know that it is false that all S is P; but this does not alter the truth of the proposition that, relative to my first n observations, it *is* highly probable that all S is P. For the probability of a proposition may be high with respect to one set of data and may be zero with respect to another set which includes the former. Our original inductive conclusion does not cease to be *true*, it only ceases to be practically important.

For all these reasons I hold that we have established the point that inductive *conclusions* must be modified if induction is to be saved and that no additional *premises* will suffice to save it. And I think it almost certain that the direction in which the modification must be made is the one which I have indicated above. Leibniz said in a famous passage that Spinoza would be right if it were not for the monads; we may say that Hume would be right if it were not for the laws of probability. And just as it is doubtful whether Leibniz was right even with the monads, so there remains a grave doubt whether induction can be logically justified even with the laws of probability.

2.

If we accept the view that inductive conclusions are in terms of probability, it is clear that a necessary premise or principle of all inductive argument will be some proposition or propositions concerning probability. Since probability, like truth, implication, etc., is an attribute of propositions, the laws of probability are laws of logic, not of nature, just like the principle of the syllogism or the law of contradiction. That is, they are principles which hold in all possible worlds, and do not depend on the special structure of the world that actually exists. It remains possible however that they are

only capable of fruitful application to real problems if the actual world fulfils certain conditions which need not be fulfilled in all possible worlds. *E.g.* $2 \times 2 = 4$ holds in all possible worlds, but it would be very difficult to make any practical use of this proposition in physics if all objects in the actual world were like drops of water and ran together into a single drop when mixed.

To see what the principles of probability required by induction are, and to consider whether they suffice to justify the actual strength of our beliefs in universal propositions about matters of fact, I propose to consider induction by simple enumeration and the hypothetical method in turn.

A. *Induction by Simple Enumeration.*—The way in which I propose to treat this problem is as follows. I shall first consider the logical principles employed and the factual assumptions made when we draw counters out of a bag, and, finding that all which we have drawn are white, argue to the probability of the proposition that all in the bag are white. I shall then discuss as carefully as I can the analogies and differences between this artificial case and the attempt to establish laws of nature by induction by simple enumeration. We shall then be able to see whether an alleged law of nature can logically acquire a high degree of probability by this method, and, if not, what additional assumptions are needed.

We will divide the factors of the problem into three parts, (*a*) Facts given, (*b*) Principles of probability accepted as self-evident, (*c*) Factual assumptions made.

(*a*) The facts given are:—

(i) That the bag contains n counters indistinguishable to touch.

(ii) That we have no information at the outset of the experiment what proportion of the counters are white; there may be 0, 1, 2, . . . n whites. (We know of course on *à priori* grounds that any one proportion, so long as it subsists, excludes any other, and that, at any given moment, one of these $n + 1$ possible proportions must subsist.)

(iii) That at the end of the experiment m counters have been drawn out in succession, none being replaced, and that these have all been found to be white.

(*b*) The principles of probability accepted as *à priori* truths are:—

(i) If p and q be two mutually exclusive propositions and x/h means 'the probability of x given h,' then

$$p \vee q/h = p/h + q/h.$$

(ii) If p and q be any two propositions, then

$$p.q/h = p/h \times q/p.h = q/h \times p/q.h.$$

(iii) If we know that several mutually exclusive alternatives are possible and do not know of any reason why one rather than another should be actual, the probability of any one alternative, relative to this precise state of knowledge and ignorance, is equal to that of any other of them, relative to the same data.

(iv) The present proposition is to be regarded rather as a convention for measuring probability than as a substantial proposition. It is: If p and q be coexhaustive and coexclusive propositions, then

$$p/h + q/h = 1.$$

(*c*) The assumptions which we make about matters of fact are:—

(i) That in drawing out a counter our hand is as likely to come in contact with any one as with any other of all those present in the bag at the moment.

(ii) That no process going on in nature during the experiment alters the total number or the proportion of the white counters, and that the constitution of the contents only changes during the experiment by the successive removal of counters by the experimenter.

It is clear that the propositions (*c*) are assumptions about the course of nature and have no *à priori* guarantee. This is perfectly obvious about *c* (ii), and it is evident that a factual assumption is an essential part of *c* (i) even if the *à priori* factor *b* (iii) should also somewhere be involved in it.

On these assumptions it can be proved that the probability that the *next* to be drawn will be white is $\frac{m+1}{m+2}$, and that the probability that *all* the n are white is $\frac{m+1}{n+1}$. I do not propose to go into the details of the argument, which involves the summation of two series. What I wish to point out is that all the nine propositions mentioned above are used in the proof and that no others are needed except the ordinary laws of logic and algebra. It is easy to see in a general way how the assumptions (*c*) enter. Suppose there were a kind of pocket in the bag and that non-whites happened to be accumulated there. Then *c* (i) would be false, and it is clear that a large number of whites might be drawn at first and give a misleadingly high expectation of all being white even though there were quite a large proportion of non-whites in the bag. Suppose again that *c* (ii) were false and that the proportion of whites might change between one draw and the next.

Putting the course of the argument very roughly indeed we may say that at the beginning we start with $n + 1$ equally likely hypotheses as to the constitution of the bag's contents. As we go on drawing whites and no non-whites we learn more of this constitution, certain of these hypotheses are ruled out altogether, the others have their probabilities strengthened in various degrees. But this is only true if we really do learn more about the constitution of the contents by our successive drawings; if, between these, the constitution changes from any cause, we have learnt nothing and the argument breaks down.

We can now consider how far the attempt to establish laws of nature by simple enumeration is parallel to the artificial example just dealt with. For clearness it is best to distinguish here between laws about the qualities of classes of substances [such as the law that All crows are black] and laws about the connexion of events [such as All rises of temperature are followed by expansion]. I do not suggest that this distinction is of great philosophic importance or is ultimately tenable, but it will help us for the present.

There is obviously a very close analogy between investigating the colours of crows and the colours of the counters in a bag. To the counters in the bag correspond all the crows in the universe, past, present, and future. To the pulling out and observing the colour of a counter corresponds the noticing of a certain number of crows. At this point however, the analogy fails in several ways, and all these failures tend to reduce the probability of the suggested law. (i.) The same crow might be observed several times over and counted as a different one. Thus m in the fraction $\frac{m+1}{n+1}$ might be counted to be larger than it really is and the probability thus over-estimated. (ii.) We have no guarantee whatever that crows may not change their colours in the course of their lives. (This possibility was of course also present in the artificial case of counters, and our only ground for rejecting it is in previous inductions.) (iii.) It is quite certain that we are not equally likely to meet with any crow. Even if we grant that any past crow is equally likely to have been met with and its colour reported to us, we know that the assumption of equiprobability is false as to future crows. For we clearly cannot have observed any of the crows that begin to exist after the moment when we make the last observation which we take into account when we make our induction. And the assumption of equiprobability is most precarious

even as regards past and present crows. Neither by direct observation nor by the reports of others can I know about crows in any but a restricted region of space. Thus the blackness of the observed crows may not be an attribute of all crows but may be true only of crows in a certain area. Outside this it may fail, as whiteness has been found to fail in the case of Australian swans. Our situation then is like that which would arise with the bag of counters if (*a*) there were a rigid partition in it past which we could not get our hands (distinction of past and future cases), and (*b*) if the bag were much bigger than the extreme stretch of our arm and we could only enter it through one comparatively small opening (restricted area of observation in space). We may sum up this objection by saying that the argument which leads to the probability $\frac{m+1}{n+1}$ assumes that a 'fair selection' has been observed, and that in the case of the crows we know that a 'fair selection' cannot have been observed owing to the fact that I cannot *now* observe *future* instances, and that I cannot directly observe even contemporary instances in all parts of space.

It is easy to prove that when we know that a 'fair selection' has not been observed the probability of a general law must fall below and can never rise above the value $\frac{m+1}{n+1}$ which it reaches if the observed selection be a fair one. Let us suppose that all the S's that might actually have been observed were SQ's; that, *within this class*, the selection observed was a fair one, though not fair for the S's as a whole; and that the number of SQ's is ν. Then, since the number of SQ's examined was m and all were found to be P, the probability that all Sθ's are P is $\frac{m+1}{\nu+1}$. The number of S$\bar{\text{Q}}$'s is $n-\nu$; but, by hypothesis, none of these came under examination. Hence we have no information whatever about them, and the probability that any proportion from O to the whole $n-\nu$ inclusive is P is the same, *viz.*, $\frac{1}{n-\nu+1}$. Now the probability that All S's are P = the probability of the compound proposition: All SQ's are P and All S$\bar{\text{Q}}$'s are P. This cannot exceed $\frac{m+1}{\nu+1}\frac{1}{n-\nu+1}$. It is evident that this is

less than $\frac{m+1}{n+1}$; for its numerator is the same, whilst its denominator is $n + 1 + \nu(n - \nu)$, which is greater than $n + 1$, since ν is a positive integer less than n.

(iv.) Lastly there is the following fatal difference even if all other difficulties could be overcome. In investigating the counters in the bag we know the total number n. It is finite, and we can make the number m of counters observed approximate fairly closely to it. We do not of course know the total number of crows that have been, are, and will be; but we can be perfectly sure that it must be enormous compared with the number investigated. Hence m is very small compared with n in the investigation of any natural law. Hence $\frac{m+1}{n+1}$, the probability of the law, as determined by induction by simple enumeration, is vanishingly small even under the impossibly favourable conditions of a 'fair selection'. In real life it will be indefinitely smaller than this indefinitely small fraction.

It must be noted, however, that from the same premises from which we deduced the expression $\frac{m+1}{n+1}$ for the probability that *all* S's are P we also deduced the expression $\frac{m+1}{m+2}$ for the probability that the *next* S to be examined will be P. A more general formula which can also be proved from the same premises is that the probability that the next μ to be examined will be P is $\frac{m+1}{m+\mu+1}$. These latter expressions, it will be noted, are independent of n. Hence, if we could get over the difficulties about a 'fair selection' and about possible changes in time and possible repeated examinations of the same S, induction by simple enumeration would play a modest but useful *rôle* even in the investigation of nature. If m were pretty large both in itself and as compared with μ we could predict for the next case and for the next few with tolerable certainty. But this assumes that the 'next case' is one which had as much likelihood as any other of falling under our observations, though it did not actually do so. In the case of persistent entities like counters and crows this condition may perfectly well be fulfilled, for the

'next' simply means the 'next which I happen to observe'. In the case of the counters the one which I shall pull out next was in the bag all through the experiment and was as likely to be taken out as those which actually were taken out. In that of the crows the crow that I shall next observe may have existed when I observed the previous ones, and may have been as likely to fall under my observation as any of those which actually did so. But, as we shall see in a moment, there are special difficulties about events which will not allow us to apply this reasoning to them.

We will now consider the connection of events. Much of what has been said about the investigation of the properties of substances remains true here, but there are the following differences to be noted. Suppose our events are rises in temperature. The class about which we wish to learn is all events of this kind past, present, and future. Now events, unlike substances, cannot change; each is tied to its own position in time and is determined by it. There is no possibility that the *same* rise in temperature should be at one moment followed by an expansion and at another not, as there is a possibility that the same crow may sometimes be black and sometimes white. Rises of temperature at different times are different rises of temperature; it is of course perfectly possible that one may be and another may not be followed by an expansion, but the *same* one cannot occur at two different moments and therefore cannot have different sequents at different times. Hence one difficulty inherent in investigating substances and their properties is ruled out in investigating events and their connexion.

For similar reasons there is no possibility of observing the same event twice, as there is of investigating the same crow twice. In observing events the position is quite parallel to pulling out counters and not putting them back. What is secured artificially in the counter experiment is secured in investigating events by the fact that each event is tied to its moment and ceases to belong to the class of observable events when that moment is past.

So far the inductive observation of events is in a stronger position than that of substances. But here its advantages cease. There is clearly the same impossibility of observing any finite proportion of the whole class, and hence of ascribing any appreciable probability to a general law about its members. There is the same difficulty about observing a 'fair selection' in space. And there is a still more hopeless difficulty about predicting the future even for the next event of the class. For it is perfectly certain that I could not up

to now have observed any event which belongs to a moment later than my last observation. Hence the condition of equiprobability breaks down and my observations add nothing to the probability that the next event to be observed will agree with those which I have already observed. With substances, as we saw, it was possible that the next one to be observed had an equal chance of having been observed with any of those which I actually happened to notice. Hence there was a possibility of predicting a few steps ahead if we assume that the substances are not changing their qualities. But this is because substances persist for a time and are not tied to single moments like events.

I conclude then that, neither for substances nor for events, will the principle of probability alone allow us to ascribe a finite probability to general laws by induction by simple enumeration. In the case of substances we can argue a few steps ahead if we can assume a 'fair selection' in space, and can further assume that the substances do not change in the property in question over the time for which we are observing and predicting. For events even this amount of prediction is incapable of logical justification. And the latter fact really invalidates the process for substances. For, if our ground for assuming that the substances will not change their attributes be inductive, it must be an induction about events. The possession of an attribute at each moment of a duration constitutes a class of events, and to argue inductively that there will be no change is to argue from observations on some of the earlier members of this class to the later ones which cannot fall into the class of those which it was equally likely for us to have observed up to the moment at which we stop our observations. It was for this, among other reasons, that I said that the distinction between inductions about substances and inductions about events, though convenient in discussing the subject, was not of ultimate philosophic importance.

Before leaving induction by simple enumeration and passing to the hypothetical method it may be of interest to remark that, in theory, there are two quite different reasons for trying to enlarge the number of our observations as much as possible. (i.) We want to examine as many S's as possible simply in order to increase the proportion of m to n in the fraction $\frac{m+1}{n+1}$. For this purpose it is quite irrelevant whether the observed instances happen under very similar or under very diverse circumstances. It is simply the number

that counts. Unfortunately in investigating nature it is of little use to worry ourselves to increase m for this reason, since we know that however much we increase it, it will remain vanishingly small compared with n. (ii.) We want to examine S's under as many different circumstances as possible. This is so as to approximate as nearly as we can to a 'fair selection'. Here it is not the mere number of instances that counts but the number of different circumstances under which the observed instances happen. Unfortunately however well we succeed in this we cannot raise the probability above $\frac{m+1}{n+1}$, we can only ensure that it shall not fall indefinitely below that indefinitely small fraction.

B. *The Hypothetical Method.*—I shall first briefly state the connexion between this and induction by simple enumeration. I shall then consider the logical principles on which the hypothetical method is based and see whether they, without additional assumptions about nature, will suffice to give a finite probability to any suggested law.

Induction by simple enumeration is just a rather special case of the hypothetical method. At the outset of our experiment with the bag we have $n + 1$ equally likely hypotheses as to the constitution of its contents. After the first draw has been made and the counter found to be white one of these hypotheses is definitely refuted (*viz.* that there were no whites present). The others remain possible but no longer equally probable; the probability of each on the new datum can be calculated. After the second draw another one hypothesis is definitely refuted; the remaining $n - 1$ are all possible, but once more their probabilities have been altered in various calculable amounts by the addition of the new datum. The procedure after each draw (assuming that all turn out to be white) is the same; one hypothesis is always refuted; the rest always remain possible, and among these is always the hypothesis that all in the bag are white; and the probabilities of each are increased in various calculable degrees. The special peculiarities of this method are (*a*) that the various hypotheses are known to be mutually exclusive and to exhaust all the possibilities, (*b*) that they deal solely with the question of numbers or ratios, and (*c*) that only two of them, *viz.* the hypothesis that none are white and the hypothesis that all are white are comparable with general laws.

The reasoning of the hypothetical method in its most general form is the following. Let h be the hypothesis; it will consist of one or more propositions. We prove by

ordinary deductive reasoning that h implies the propositions $c_1, c_2 \ldots c_n$. Let h/f be the probability of the hypothesis relative to any data that we may have before we start our experiments to verify it. Then we know in general that

$$h.c_1/f = c_1/f \times h/c_1.f = h/f \times c_1/h.f.$$

If h implies c_1 it is clear that c_1/h (and $\therefore c_1/h.f) = 1$.

Hence $$c_1/f \times h/c_1.f = h/f.$$

Whence $$h/c_1.f = \frac{h/f}{c_1/f}.$$

Again $$h.c_1.c_2/f = h.c_1c_2/f = c_1c_2/f \times h/c_1c_2f = h/f \times c_1c_2/h.f.$$

But $$c_1c_2/hf = c_1/hf \times c_2/c_1hf = c_2/c_1hf.$$

And since h implies c_2 it is clear that c_2/h (and $\therefore c_2/c_1hf) = 1$.

Hence $$h/c_1c_2f = \frac{h/f}{c_1c_2/f}.$$

[1] In general, if h implies $c_1, c_2 \ldots c_n$, we shall have

$$h/c_1c_2 \ldots c_nf = \frac{h/f}{c_1c_2 \ldots c_n/f}.$$

We can learn much from a careful study of this formula. We see that the probability of a hypothesis is increased as we verify its consequences because the initial probability is the numerator of a fraction whose denominator is a product which contains more factors (and $\therefore$, since they are proper fractions, grows *smaller*) the more consequences we deduce and verify.

For $c_1c_2 \ldots c_n/f = c_1/f \times c_2/c_1f \times c_3/c_2c_1f \times \ldots c_n/c_{n-1} \ldots c_1f$. Next we see that it is only by increasing the number of verified consequences which are logically independent of each other that we increase the probability of the hypothesis. For if, *e.g.*, c_{r-1} implies c_r the factor $c_r/c_{r-1} \ldots c_1f = 1$, and so does nothing to reduce the denominator and thus increase the probability of the hypothesis. Again, the more

[1] The mathematical theory of the probability of hypotheses is treated by Boole in his *Laws of Thought*. The problem in its most general form (where it is not assumed that h *implies* $c_1, c_2 \ldots c_n$, but only that it modifies their probability) has been worked out, but not I think published, by Mr. W. E. Johnson. I take this opportunity of expressing the very great obligations which I am under to Mr. Johnson, obligations which I know are felt by all those who have had the privilege of attending his lectures on advanced logic or discussing logical problems with him. Mr. Johnson, however, must not be held responsible for the views expressed in the present paper.

unlikely the consequences were on the original data f which we had before we started to verify the hypothesis the more they increase the probability of the hypothesis if they be found to be true. For this means that the factors like c_1/f are very small, hence that the denominator is small, hence that the final value of $h/c_1c_2 \ldots c_n$ is likely to be large. This is the precise amount of truth that there is in the common view that an hypothesis is greatly strengthened by leading to some surprising consequence which is found to be true. The important point is not the psychological surprisingness of the consequence, but is the purely logical fact that *apart from* the hypothesis it was very unlikely to be true, *i.e.* it was neither implied nor rendered probable by anything that we knew when we put the hypothesis forward. Lastly we must notice that the factor h/f, expressing the probability of our hypothesis on the data known before any attempt at verification has been made, is always present in the numerator, *i.e.* as a multiplicative factor. Hence, unless we can be sure that this is not indefinitely small, we cannot be sure that the final probability of the hypothesis will be appreciable.

There is just one thing further to be said about h/f. h may be a complex set of propositions. Suppose we have two alternative hypotheses h_1 and h_2. Suppose $h_1 \equiv p_1p_2 \ldots p_m$ and $h_2 \equiv q_1q_2 \ldots q_n$, and let $n > m$. Then h_2/f is a product of n factors all fractional and h_1/f is a product of m factors all fractional. There will thus be a tendency for the less complex hypothesis to be more probable intrinsically than the more complex one. But this is only a tendency, not a general rule. The product $\frac{1}{2} \cdot \frac{3}{4} \cdot \frac{5}{6} \cdot \frac{7}{8}$ is greater than $\frac{1}{2} \cdot \frac{1}{3} \cdot \frac{5}{16}$, although the latter contains fewer factors than the former. This tendency, however, is the small amount of logical truth in the common notion that a more complicated hypothesis is less likely to be true than a simpler one.

We are now in a position to see whether the hypothetical method in general is any more capable of giving a finite probability to alleged laws of nature, without some additional premise, than its special case the method of induction by simple enumeration. I shall try to prove that, whilst the hypothetical method has many advantages which fully explain why it is the favourite instrument of all advanced sciences, it yet is insufficient, without some further assumption, to establish reasonably probable laws.

The advantages of the method are obvious enough. (i) The hypotheses of induction by simple enumeration are purely numerical and therefore no consequence can be deduced from them except the probability of getting a certain

number of favourable cases in a certain number of experiments. When hypotheses are not limited in this way the most varied consequences can be deduced, and, if verified, they increase the probability of the hypothesis. (ii) If the hypothesis be stated in mathematical form remote and obscure consequences can be deduced with all the certainty of mathematical reasoning. We thus have guidance as to what experiments to try, and powerful confirmation if our experiments succeed. The history of the wave theory of light is full of examples of this fact. (iii) If careful experiments refute some of the consequences of an hypothesis we knew of course from formal logic that the hypothesis cannot, as it stands, be true. But if most of the deduced consequences have been verified we may fairly suspect that there cannot be much wrong with the hypothesis. And the very deductions which have failed to be verified may suggest to us the kind and degree of modification that is necessary. (iv) It is true that in induction by simple enumeration we have the advantage of knowing that our alternative hypotheses are exhaustive and exclusive. But in investigating nature this is of little profit since we also know that their number is indefinitely large. Now, it might be said, in the hypothetical method, although we cannot be sure that we have envisaged all possible alternatives, yet the number of possible laws to explain a given type of phenomena cannot be extremely great, hence the intrinsic probability of none of them will be excessively small if we regard them as all equally probable before attempted verification.

This last argument seems plausible enough at first sight. Yet it is mistaken, and in exposing the mistake we shall see why it is that the hypothetical method by itself will not give an appreciable probability to any suggested law. Why is it that the intrinsic probability of the law that all S is P is vanishingly small in induction by simple enumeration whilst that of any suggested law in the hypothetical method is not, to all appearance, vanishingly small? One reason is that the alternatives taken as intrinsically equally probable are not *in pari materia* in the two methods. In induction by simple enumeration the alternatives are not various possible *laws*, but various possible *proportions*, only two of which, *viz.* 0 % and 100 % of the S's being P, are laws. In the hypothetical method we have so far assumed that the alternative hypotheses are always laws. This naturally reduces the number of possible alternatives and hence increases the intrinsic probability of each as compared with the alternatives of induction by simple enumeration. But this difference renders

comparison between the two methods unfair. If in simple enumeration alternatives other than laws are to be accepted as intrinsically as probable as laws there is no reason why the same assumption should not be made in the hypothetical method. And it is surely evident that the objections which apply to induction by simple enumeration as a sufficient means of establishing a law apply equally to the hypothetical method. All the experiments which have been made up to a given moment to verify an hypothesis can throw no light on the truth of this hypothesis as referring to moments after that at which the last experiment was performed. Now it is certain that an indefinite number of hypotheses could be put forward agreeing in their consequences up to a given moment and diverging after it. Exactly similar remarks apply to space; there can clearly be any number of alternative hypotheses which have the same consequences within a given region of space and different consequences outside it, and no experiments performed wholly within this region can give any ground for deciding between them. I think therefore that we may now claim to have proved our second contention that the degree of belief which we actually attach to the conclusions of well-established inductive arguments cannot be justified by any known principle of probability unless some further premise about the existent world be assumed. What this premise is, whether it can be stated clearly enough to admit of logical criticism, and whether in that event it will survive logical criticism, are extremely difficult questions which I reserve for the second part of this paper. What I have said so far I believe to be fairly certain, what I have yet to say I know to be extremely doubtful.

(To be continued.)

II.—THE RIGHTS AND WRONGS OF A PERSON.

(*A Sequel to "What is a Person?" July*, 1917.)

PART II. (MAN, BEAST, AND MOTHER EARTH).

BY W. M. THORBURN.

23. God forbid that I should be anything so narrow as a Philanthropist. Every sound-hearted man will try at least to be a Philozoist: not careless also of Mother Earth's vegetable vesture of beauty. The world was not made for Man, but man for the World. He is only one of God's tools, for perfecting the harmonious development of a happy, holy, and beautiful Mother Earth; well balanced in all her forms and forces.[91] The Mid-Victorian outcry against Darwin was the outcome of a shock: not so much to godly piety, as to unconscious Comtism, man-flattering Augustinity, or the boundless and baseless self-conceit of the commonplace canter; intoxicated with Stoic, Coptic, and Punic variations of that vile phrase, the Dignity of Man. The lower a half-educated biped's moral attainment, the more he magnifies the distance between himself and his fourfooted neighbours. And, as both Pascal and Rochefoucauld have remarked, the most vicious and ignorant smattering shallowpate is the slowest of all, to be impressed by the intellectual superiority of his betters, unless it is backed by some patent superiority in physical force. "The higher we soar, the smaller we look to the groundlings who cannot fly": said Nietzsche in *The Dawn of Day* (574). An honest man may be, "the noblest work of God"; as he is certainly one of the rarest: in places like Wales or Muscovy, Chicago or the City of London. But it is not much, to be a mere human being. It is more, to be a Sperm Whale, or a Great Bird of Paradise: far more, to be an Elephant, or a well-bred black and white Collie, untainted with the rufous tint and temper of the Gordon Setter.

[91] Compare Henry Sidgwick's formula: "The well-being . . . of the whole universe of living things": *Practical Ethics*, 63 (ch. iii., Public Morality, 1897. And F. C. S. Schiller's "Ideal of a harmonious interaction of individual existences": *Riddles of the Sphinx*, XI., 25.

There is a Dignity of Birth, and a Dignity of Function: a Dignity of Age, and a Dignity of Achievement: a Dignity of Learning, a Dignity of Skill, and a Dignity of Character. But the Dignity of Man is a *Chimaera bombinans in vacuo:* only a little less absurd than the Dignity of Monkey.

(*b*) In this maudlin age of levelling and overcrowding, it is before all things necessary, to preach the righteousness of inequality and the insignificance of the common bimanous biped. Man the Image of God, forsooth! That is only a piece of Man's vainglorious impudence: a complete contradiction of all the relevant facts. All Archæology converges to prove, what Xenophanes[92] recorded twenty-five centuries ago; that men have always made their gods *in their own images.* The Thracian gods were red-haired and fair-skinned: the Ethiopian black, flat-nosed, and woolly-headed. And had Lions hands, they would make gods with manes and tails. How indeed can there be any image of the Supreme Invisible: Who dwelleth in light inaccessible and full of glory: whom no man hath seen, nor can see? Philo Judaeus, in his *De Mundi Opificio* and *Legum Allegoriae,* denies that Adam was "made in the image of God": as commonly understood. Philo's notion is summed up thus by Dr. James Drummond[93] on page 276 of his second volume: "The Ideal man was a thought generated within the Divine Reason; and the earthly concrete man was an imperfect copy of this heavenly archetype". Philo's understanding of Genesis (in regard to i. 26 and 27; v. 3; and ix. 6), seems to be: that the Hebrew word *Zelem;* translated *Eikōn* in the Septuagint, *Imago* in the Vulgate, and *Image* in English; did not there mean the result of a material copying of God himself, but of an Idea in the mind of God. This Ideal was an archetypal mental pattern of the Genus *Homo,* of which he made material copies, "male and female"; according to Genesis v. 2. The female copy at least could not be a copy of God himself; whom the Hebrews conceived as male or sexless. Just so, the first elephants were material copies of an Image or Idea of the

[92] Xenophanes: *Fragment,* 6: on p. 41 of Karsten's *Phil. Grace. Vet. Reliquiae.* See also Clement of Alexandria: *Stromateis,* V., 14 (pp. 277 and 285 of his 2nd volume in the Ante-Nicene Library). The Stoics according to Diogenes Laertius (*Zeno,* 72) held that God was a perfect immortal animal, not having the figure of a man: Zeller's *Stoics and Epicureans,* 149 and 346 (in Eng.). For the Egyptian and Babylonian deification of Man, see Sayce: *Religion of Egypt and Babylon,* pp. 37, 41-43, 241, 280-290. "Even the ordinary man contained within him a particle of effluence of the divine essence," p. 241 (Egypt).

[93] Many references are given on pp. 215 and 275-280, in vol. ii. of Drummond's *Philo Judaeus* (1888).

Genus *Elephas*, existing in the Divine imagination. And just so, even the first trees of every Genus (and Species) were material copies of a Celestial Generic or Specific Ideal.[94] Similar opinions are expressed by Moses Maimonides in the first chapter of his *Guide to the Perplexed*. "The Hebrew equivalent of *form* in the ordinary acceptation of the word, *viz.*, the figure and shape of a thing, is *Toär*. The term *Zelem* on the other hand signifies the *specific form* of man, his intellectual perception, and does not refer to his *figure* or *shape*. . . . *Demut* (likeness) . . . denotes agreement with regard to some abstract relation. . . . Man's distinction consists in a property which no other creature on earth possesses: intellectual perception. . . . On this account, . . . he is said to have been made in the form and likeness of the Almighty."[95] But, since Darwin, no open-minded student of science can doubt, that this fancied exclusively human possession is common, in various degrees, to every one of God's sensitive creatures.

24. *L'Anthropolatrie: voilá l'ennemi!* must be the watchword of every God-fearing student of Science and Justice. *Ecrasez l'infâme!* The most effective servants of Satan are the impious imbeciles, who make a dirty little deity out of every lump of animated rubbish, that can be classified under the Genus *Homo* of the Family *Anthropini*. The Western Sentiment of Human Sacrosanctity is not only the most impudent of all Heresies, but the poisonous climax of all Hypocrisy. It has never prevented the fiery immolation of actual or imaginary enemies under the name of Witches or Heretics, nor the wholesale murder and torture wantonly perpetrated under the name of War.[96] Yet a soldier, deco-

[94] Philo: *Plantatio Noe*, 11.

[95] Again, in ch. 51 of Part III., Maimonides says: "The intellect which emanates from God unto us is the link which joins us to God".

[96] Remember Sherman's "War is Hell": as he and Napoleon made it: though for a century before the French Revolution War had been growing ever milder. As the French General, Comte J. A. H. de Guibert († 1790), cynically deplored in his *Essai General de Tactique*, which so powerfully stimulated the Corsican Genius of Evil: "To-day (1770) the whole of Europe is civilised. Wars have become less cruel. Save in combat no blood is shed; prisoners are respected; towns are no more destroyed; the countryside is no more ravaged. Conquered peoples are only liable to pay some sort of contributions, which are often less heavy than the taxes they pay to their own sovereign." Introduction, § 3, p. 21. The insidious hints of paralysing cruelty in his Preliminary Discourse (pp. 17, 58, 62); though reprobated during his lifetime; were eagerly taken up by the soldiers of the Revolution, systematised by their despot, and thus more or less forced into adoption on the part of his opponents. Finally therefore, his lucrative reversion to barbarity was stereotyped by Clausewitz in his Classic treatise *On War:* especially Book V., ch. 14, §§ 1

rated for shooting a dozen honest Boers, came home to run the risk of being treated as a felon, if he should fire a shot at some incendiary plunderpig in the flames of the London or Bristol Docks. The vogue of this fœtid phantasm has been cunningly converted by greedy Forensic Pharisees, into impunity for the rioter and the robber.[97] It is the subterfuge of every atrocity inflicted on our helpless fellow-vertebrates. And it still prolongs the agony of the incurable, when anodynes or anæsthetics ought to be given (as they were to Mr. Gladstone), with a single eye to the relief of pain. For, Life is to be valued, only as the framework of happiness and usefulness. It is *Sacred*, only so far as likely to contribute materially to the harmonious development of the world, in accordance with the divine purposes gradually unfolded to us, by Science and the right understanding of Scripture. And otherwise, it is worthy of protection, only in so far as it is happy and harmless. For, Being without Well-Being is nothing but a Curse. And the higher the Being, the greater the Curse.[98]

(*b*) Fundamentally, that Sentiment seems to be a metaphysical transformation of the Primitive Ghost-Fright, which still prevents the unreasoning from putting sick or wounded quadrupeds out of their misery;[99] as of old it subjected

and 4. This chapter may be compared with the 18th chapter (on Subsistence) in Guibert's Second Part. Compare also with Ch. 5 of Part I. in Hamley's *Operations of War*.

[97] Hale: *Pleas of the Crown*, I, 479-489. The "Christian duty" of running away, from a robber whom you could disable or destroy, was invented by Basil (*Ad Amphilochium*, 55, in P.G. XXXII., 795). It was reaffirmed by Ambrose in a didactic work compiled for the clergy only: *De Officiis Ministrorum*, III., 4 (27). As laymen were not expressly exempted, the scope of it was easily misrepresented. Some time in the 17th Century, the Ambrosian duty seems to have been imposed on English laymen, through the fraudulent force of unwarranted analogical extension; though Coke stoutly maintained that an honest man was not bound to retreat before a thief: *Third Institute*, 55. Hale, it seems, is the imp of iniquity, who must be chiefly cursed for this legal infamy. He was a wicked old witchbaiter: destitute of any real love for justice, in spite of his great Whig reputation.

[98] Francis Bacon: *De Augmentis Scientiarum*, VIII., *cap.* 2: vol. i., p. 790 of *Works* in Spedding's edition: "Quod ipsum *Esse* sejunctum a *Bene Esse*, maledictionis loco sit, et quo grandius sit *Esse*, eo major sit maledictio". Life is nothing; and Death is nothing; and Pleasure is next to nothing. But Freedom from Pain is nearly everything: the necessary substratum of all Well-being.

[99] Philo Judaeus denounced Infanticide by Exposure, as the worst kind of murder; horrifying by the probability of agony: *De Specialibus Legibus*, 6. In September, 1910, Sir Gerard Lowther wrote from the Constantinople Embassy, to inform the R.S.P.C.A., that thousands of dogs, who had been dying of hunger and thirst on the island of Oxia, were now

superfluous infants to the unlimited horrors of exposure, and denied to them the mercy of speedy suffocation. But it is coloured with hazy delusions about the Dignity of Man, drawn by Tertullian from the Stoic Pantheism,[100] which John Scotus Erigena and Averroes afterwards handed down to the philosophers of the Renaissance, the *Aufklärung*, and the Revolution. And among Christians, it has been greatly intensified by the lurid fancies of Augustinian Eschatology, nurtured, if not begotten, in an atmosphere of Carthaginian Cruelty. We may indeed affirm, that the current cant about Self-Murder was foisted on the Church in the Fourth and Fifth Centuries, by North African Moloch-stokers and self-torturing Levantine Fakirs. It began as a Carthaginian excrescence on Christian Tradition, and has always been devoid of the slightest Oecumenical authority.

(*c*) By Anthropolatry, however, we must understand; not the ennobling practice of Hero-Worship: in all Ages the ladder of true godliness. But especially that modern deification of the typical average anthropine biped, which is only a round-about way for every fool-brute to worship himself: in short the Apotheosis of the Cockney Costermonger. Extreme examples of the North American *Homini-Cultus* are easily accessible to the English reader in recent issues of the *Hibbert Journal*. Prof. Overstreet (of the New York City College) has followed up his *Democratic Conception of God* (Jan. 1913) with *God as the Common Will* (Oct. 1914). In the former, Rousseau's cheating cloud-word (the Common Will), supplemented with the Professor's own *Ober-Hegelisch* "Self-modification of mass-life," led us up to: "The God that is ourselves" (p. 410). We were told that: "(a) Society, democratic from end to end, can brook no such radical class-distinction, as that between a supreme being favoured with eternal and absolute perfection, and the mass of beings doomed to the lower ways of imperfect struggle". From the later article we learn, that: "Religious devotion (in all men) . . . is a loyalty to the God-life

being mercifully destroyed by poison: the Turks having been led to see the wickedness of the old practice of marooning. Otherwise the Turks, (as travellers in the Levant have usually noticed), have always been kinder than Christians to "dumb" animals. See Montaigne's *Essays*, vol. ii., ch. 11 (Of Crueltie, near end). Also Townshend's *Military Consul in Turkey* (1909), 145-147. And Brailsford's *Macedonia* (1906), 109. On the Psychology of the superstition see Farnell's *Higher Aspects of Greek Religion*, 89.

[100] "Pantheism is self-deification": Hodge's *Systematic Theology*, I., 301. "Pantheism is, for all religious purposes, identical with Atheism": Dean Mansel on Kant, in *Letters, Lectures, and Reviews*, p. 181. See also his *Limits of Religious Thought*, Lecture II., p. 54. For Tertullian's Stoicism, see Harnack's *History of Dogma*, vol. v., p. 21, in English.

that is in them" (p. 174); and he concludes by assuring the Boy and Girl Tyrants of the Great Manhattan Wolf-pack (on the authority of E. D. Starbuck), that: "all are the incarnation of the spirit of eternal beauty and worth and truth"! This orgy of anthropine self-laudation overtops indeed even Anselm's *Cur Deus Homo*, as the Culminating Impudence of Man.[101]

25. The ultimate value of any animal depends very largely on its rarity. A man is only one of 1,600,000,000: the commonest, and individually the most easily spared, of all the larger mammals. "The life of a man is of no greater importance to the universe than that of an oyster. . . . An insect is able to destroy this mighty being, whose life is of such importance. Is it an absurdity, to suppose that human prudence may lawfully dispose of what depends on such insignificant causes?"[102] Every square-mouthed rhinoceros, butchered on the banks of the White Nile, to make a bloody British holiday for Roosevelt or Clodius Secundus, was (to say the least) worth his weight in members of the House of Commons. And it would be really shameful; not to take a safe shot at any pothunter or trophy-hunter, black or white, in order to save one of the fast-vanishing family of Giraffes. At no period of the Earth's history; even when men were fewest, and elephants most abundant; could it be said that one typical talking biped was of more value to the divine world-purpose, than one typical fourfooted tusker. And it could never be aught but a foul sin, to murder a magnificent and magnanimous quadruped, for the games and gewgaws of some superfluous gambling biped. From a purely moral point of view indeed, the typical Old English curly blunt-nosed sheep-dog is perhaps the highest of vertebrate varieties. "There are many things more divine than man;" said Aristotle;[103] thinking of the sun in his glory, and the stars in their courses. But he had no need to look so far from the Akropolis of Athens. Men may come, and men *must* go; but there is no

[101] Much that is useful, as an antidote to this impious nebulous nonsense, will be found in Sir William Ramsay's long (and loosely-named) Introduction to his *Cities of St. Paul*: "Paulinism in the Græco-Roman World".

[102] Hume's *Essay on Suicide* (middle). Compare Montesquieu: *Lettres Persanes*, 76: "All these notions have no other springs but our own pride; we do not see our own Insignificance". Also Sir Alfred Lyall: *Life* by Durand, 109: "We overrate altogether the importance of the human race, its doings and its destinies".

[103] *N. Ethics*, VI., 7. Compare Plotinus: *Ennead* II., c. 9 (Against the Gnostics), ss. 5 and 13: "Nor again, is it fit to assert that the souls of the vilest men are immortal and divine," § 5.

honest reason why a tower or a temple, a family-home or a family-estate, should not go on for ever. The clearest note of the highest national culture is the persistent connection of families with localities. A forest may live as long as a mountain, and a single oak-tree may feast the eyes of forty anthropine generations. Verona and the Vatican, in the divine scheme of things, outweigh all existing ignoble Italians; and Philae with its palms was worth far more, than all the Fellahin who ever scratched the mud of the Delta. Our great English Cathedrals, or our great British Museum, would be cheaply saved at the cost of half the British population.[104] For, after all, it would only be an anticipation. Everybody must die sooner or later. And the national loss, if it were a loss, could be repaired in half a century, even without a Franconian Dispensation.[105] The anthropine stock would be all the same to our grandchildren in quantity, and might be very much better in quality.

(*b*) There is a Golden Mean in the multiplication of *Human Beings*, as of everything else. No pluvial deluge could ever do so much damage as the present "devastating flood of (unhappy) babies".[106] We may easily have too many men and women, even for their own comfort: not to mention other and higher aspects of divine policy. We have already far too many in certain regions, even if all were just men needing no repentance. There is need, and there must be room, for some specimens of every flowering plant, and every vertebrate animal.[107] But taking her all round,

[104] The worse half of course.

[105] During the Thirty Years War (1618-48), Franconia (like most of Middle Germany) lost so many men by battle and murder, that only one man was left for four or five women. In 1650, therefore, the Prince-Archbishop of Mainz and the Estates of the Franconian Circle (with the Pope's permission) allowed every priest to marry, and every layman to have two wives at once: Menzel's *History of Germany*, XVIII., c. 211. In Moravia about the same time, there was similar legislation: according to the nameless writer on M. in the *Enc. Brit.*

[106] The phrase must, I believe, be credited to the mellowed agitator, who now (1914) supervises our Local Government.

[107] See C. G. Schilling: *With Flashlight and Rifle* (in Africa), pp. 1-15 (On the Tragedy of Civilisation). In his Introduction to that work, Sir H. H. Johnston admirably says: "The world will become very uninteresting, if man and his few domestic animals, together with the rat, the mouse, and the sparrow, are its only inhabitants among the vertebrates. . . . Aesthetically, the egret, toucan, bird of Paradise, grebe, sable, chinchilla, and furseal are as important as the well-dressed woman. The viper, lion, tiger, crocodile, wolf, vulture, and rhinoceros have all their places to fill in our world-picture. They are amazingly interesting, and therefore their destruction should only be carried out to the degree of keeping them in their proper sphere": p. xvi. On p. xviii. he says:

our good old Mother may already have men enough for all desirable developments. At least a third of the solid surface (in every quarter of the globe) ought always to be kept as waste and woodland, for regulation of rainfall, and other purposes moral as well as material. The magnanimous man must be able to retreat from the commonplace:[108] must have easy access to refreshing solitude, in soothing and elevating communion with things older and greater than humankind: with mountain, moor, and forest: the magic of running water,[109] and the majesty of the ocean-tide. What sort of man would care to live in a crowded smoky world, everywhere like the Potteries and the Hundred of Salford: the West Riding Coalfield and the Lower Ward of Lanarkshire? Poverty might be no great hardship to a philosopher in a shepherd's hut, or a forester's lodge; especially if he had some access to the books of a sympathetic employer. But he would suffer hell upon earth, among the curious malicious blockheads of a mining village.

26. One may value the Earth's green mantle far above the mining, manufacturing, and stock-jobbing millions who deface and defile it; even though he cannot follow Fichte in ascribing a Soul to every Plant. Fichte[110] indeed was not singular in entertaining such a notion: fantastic as it may seem. Plutarch[111] has told us that: "Plato and Empedocles believe that plants are animals, and are endowed with souls". The Manichaean Elect dared not even

"A nice balance must be struck". Much more to the same enlightened effect will be found in his Article in the *Nineteenth Century* of September, 1913: on *Fauna, Flora, and Scenery*. See also J. S. Mill's noble protest against the squalid disfigurement of the Earth, for the mere multiplication of men and money: the sole idea of the "Manchester School" of politicians: "A stationary state of capital and population implies no stationary state of human improvement": *Political Economy*, IV., 6 (2).

[108] "Whose word shall some day rise and crash,
Within him much doth shroud,
And who would be the lightning-flash,
Must long remain—a cloud."

Nietzsche: *Poems*, p. 243 of the translation by John Gray, appended to Tille's edition of the *Genealogy of Morals*.

[109] Henley's *Book of Verses*, p. 95: Life and Death (Echoes), XXXII.: "Oh, the magic of running water". Scott speaks of the traditional magic in *The Lay of the Last Minstrel*, III., 13: "The running stream dissolved the spell".

[110] Fichte: *Science of Rights*; Appendix XIV. and XVII., pp. 502-505 in English Translation by Kroeger and Harris.

[111] Plutarch: *Placita Philosophorum*, V., 26: referring to Plato's *Timaeus*, 77.

pluck a fruit or break a twig.[112] And the Franciscan *Summa Astensis* (A.D. 1317) quaintly says that some query; whether the Divine Precept, *Non Occides*, forbids us to kill: "plantas et alia bruta".[113] Montaigne dallies with similar speculations at the end of his Essay on Crueltie (II., 11). Insectivorous, and other Sensitive Plants, such as *Mimosa*, *Oxalis*, and *Impatiens*, seem to protest against the assumed radical distinctions between animal and vegetable: which are certainly not easy to perceive in the lowest grades of both kingdoms. Sir James Simpson first narcotized a Mimosa shrub. Verworn has recorded similar experiments, and found *Mimosa Pudica* responsive to electric stimulation.[114] Nobody who has ever walked through a field of the creeping sensitive *Mimosa Natans*, so common in the Godāvari Delta, will ever forget the uncanny sight of the rippling sea of leaves, folding up two or three yards in advance of his footsteps.

(*b*) J. E. Taylor has made many readers open their eyes over his enthusiastic *Sagacity and Morality of Plants*. He does not however mention an example of the former quality, which must have been noticed by many observers of thorny trees in arid regions; though I have not come across any description of it in print. The fennel-scented Woodapple (*Feronia Elephantum*), and several of the spiny Mimosas and Acacias so common in the Dekkan, look for many years like prostrate trailing plants. They spread themselves close to the ground, to get the greatest possible quantity of dew, and to keep the sun from the soil about their tender roots. When their taproots have got far enough down, to resist an ordinary hot season at its height, they shoot up a central stem at the rate of a yard a year. And in the very driest places, some trees, like the conspicuous Umbrella-Babul, repeat the lateral dew-catching growth at the top; gradually dropping the lower branches which demand more nourishment than they help to supply. As to the scope of our divine duties in regard to the perfection of the world: what Nietzsche might have called the *Welt-Hellenismus:* attention is well deserved by G. M. Gould's *Meaning and Method of Life: a Search for Religion in Biology*. "The clearest evidence of the common duty of humanity towards the Plant-World consists in the sin of deforestation," . . . destroying

[112] Harnack: *History of Dogma*, vol. iii., p. 327 (in English): Appendix on the Manichees.

[113] *Summa Astensis* (1317): Book I., Title 25.

[114] Verworn: *General Physiology*, pp. 227, 374, 380, and 426 (in English); chapters iii. (3 C) and v (2 A). Simpson: *Anaesthesia and Hospitalism*, p. 256. L. Jost: *Physiology of Plants*, Lecture 40, p. 516: see also Lecture 41 (pp. 521 and 528) on allied topics.

"the exquisite balance established by *Biologos:*" [115] his name for a Life-Creator, who is not Omnipotent, but something more than a Gnostic *Demiourgos.*

(*c*) The moneygrubbing foulers of fresh air and running water may howl at this, as the Chocolate Press lately howled at Sir John Ramsden of Byrom: [116] "Are not men more than trees or trout"? I fling back an unfaltering, "No". I am the friend of many a great and ancient tree; not to speak of many a noble stretch of woodland; which I would save without the slightest compunction, by throwing bombs into a Vandal horde of Hooleys and Hooligans. An average man may indeed be of more potential value to the world than an average trout; but not of more value than all trout, or even all the trout in a single river. The world would not be complete without trout,[117] and there is no trout who is not good for something. But there are many men who are a great deal less than good-for-nothing: whose existence is a positive evil, a pure curse to the rest of God's sensitive creatures. And the world may have too much even of a good thing.[118] An exclusive vertebrate population of men would be worse for the Earth, than an exclusive population of Saurians. The Saurians would at least leave it green.

27. "Just as Copernicus smote the conceited belief out of humankind, that their kingdom, the Earth, was the centre of the Universe; so Darwin has put an end to their assumption, that they occupy an exceptional position on our planet." [119] The Mighty Drama of Mankind dwindles in true

[115] Chapter xiii. (Ethics), p. 257. This very powerful and constructive work by a New York Physician is almost unknown in Europe; perhaps because it was damned with faint praise by the platitudinous Platonist Royce, in the *International Journal of Ethics* of October, 1893.

[116] See the *Times* of 18th March, 1913.

[117] It may be as well, to anticipate the snarling Democrat, by saying that I am not an Angler, nor an owner of any angling right.

[118] "And God fulfills himself in many ways,
Lest one good custom should corrupt the world."
—Tennyson: *Morte D'Arthur.*

[119] Conrad Guenther: *Darwinism and the Problems of Life*, ch. ii., p. 79. Mark Pattison in 1884 deplored the revival in Oxford of: "An *a priori* philosophy, which under various disguises aimed at exempting Man from the order of nature, and erecting him into a unique being": *Memoirs*, 242-243. But Dean Inge of St. Paul's in 1912 was not afraid to say: "We can no longer look upon our race as the only important part of God's Creation, nor upon our earth as the centre of the Universe": *The Church and the Age*, 25. See Darwin's *Descent of Man*, vol. i., pp. 10, 105-107, 124-126, and 155-157; for the intelligence and virtue of some baboons. "Baboons have a language": says that careful recent observer, C. G. Schilling: in *Flashlight and Rifle*, II., 559. Huxley says:

perspective, to a side-show on one of the smaller satellites of a second-rate star. How sickening it is, to any one with the smallest tincture of the true scientific spirit, to read or hear the current cant about the mystery of that mighty and majestic creature, Man! The biggest and strongest British Workman, our local avatār of democratic divinity, is not half so mighty as a tiger, nor half so majestic as a bison. And there is still exactly the same mystery about the birth of a bull-pup and the birth of a baby. We know merely that Biology has thrown some new light on Hegel's paradoxical recension of Herakleitus. Life is Change: not a *Being*, but a restless *Becoming*. All life is mysterious, but all things living are pretty certainly Highland Cousins: from the Protozoa up to the President of the Royal Society. As the life-history of the human embryo unrolls a summary of our race-progress, from very lowly beginnings through the common ancestor of men and monkeys; so are the ethics of schoolboy, poacher, and Limehouse Liberal, the survival or recrudescence of an aboriginal Thief-Morality. At the very outset of Butler's *Analogy*,[120] we find the candid admission, that there are nearly the same reasons for believing that all animals have "immortal souls," as for believing merely that all human beings are so endowed. The "Primitive Instinct" of Mankind, whatever may be its worth, points in the same

in *Man's Place in Nature*, 142: "The difference in weight of brain between the highest and the lowest man is far greater, relatively and absolutely, than that between the lowest man and the highest ape". And on p. 143: "The cerebral differences of man and apes are not of more than generic value; his Family-Distinction (*Anthropini*) resting chiefly on his dentition, his pelvis, and his lower limbs". Metschnikoff says: *Nature of Man*, ch. v., p. 81; that the main differences are in the reproductive organs.

[120] Butler's Analogy, I., ch. i., § 21. As to the Egyptian origin of the theory of Natural Immortality, see Herodotus: *History*, II., § 123: and Sayce's *Religion of Egypt*, Lecture III. John Wesley inclined to a belief in "Animal" Immortality: Southey's *Life of Wesley*, ch. 20 (near end). So did the Seventh Earl of Shaftesbury. See his letter to Miss F. P. Cobbe, in her Autobiography, p. 573. And so did William James of Harvard: as appears on p. 69 of his Lecture on *Human Immortality*. Ruskin wrote to Mrs. Talbot, regarding a cat who died in saving the last of four kittens from a burning theatre: "That cat is blessed. I hope to meet her in heaven": *Works* (Library Edition), vol. 34, p. 723. Luther said: "There will be little dogs in heaven": *Table Talk* (on the Resurrection), no. 797 in Hazlitt's English edition. For a truly Humane Philosophy based on exact science, read *The New Ethics*, and *The Universal Kinship*, by the late J. Howard Moore of Chicago; which have recently been published in London. There is also an excellent abridgement of the second work, by the English Philozoist, Ernest Bell, under the title of *The Whole World Kin*.

direction. Savages fear the ghost of a hunted tiger, not less than the ghost of a murdered enemy.

(*b*) The orthodox are now, however, permitted to hold, that Life after Death is the special gift of God,[121] not the general heritage of Man. Worry no more about your own soul, or the soul of your neighbour. God will look after His chosen; and kindly extinguish the rest, after they have suffered their proportionate punishment: if they have been bad enough to deserve a resurrection. In all grades of the animal kingdom, many are called into life, but few are chosen for survival; and fewer still for elevation to a higher type. Even if it were possible, there would be no more reason for providing all men with equal opportunities of "realising themselves," than for trying to ensure that every caterpillar shall become a moth or a butterfly. A superfluous man is a far greater evil than ten thousand superfluous moths. What the world needs, is not More Men, but Better Men. Better, not in the sense of being more highly "educated," but in the sense of being better fitted for, and better contented with, the various anthropine grades and functions; necessary for the structure of a stable social pyramid, and for the working of a perfect world-machine. A world of University-Graduates would be little better than a world of steeplejacks or tightrope-dancers. Commonplace persons ought to be satisfied with the common places of the world. The Boers are right in thinking that a Kaffir at College is like a donkey at a dinner-table: useful matter very much out of place.

28. As Mr. Fuller of Harvard has forcibly shown, in his recent illuminating *Problem of Evil in Plotinus* (Introduction, 3-7), nobody can "realise himself," without interfering

[121] Gladstone's edition of Bishop Butler's *Works*, III., 260. Sir G. G. Stokes on *Conditional Immortality:* quoting Irenæus (*Against Heresies*, II., 34, § 2); and Justin Martyr (*Dialogue with Trypho*, 5 and 6). Locke: *Reasonableness of Christianity*, § 1. Whately: *Peculiarities of Christianity*, I., § 11; and *Lectures on a Future State*. Edward White's comprehensive and cogent *Life in Christ*. Samuel Minton, on the title-page of his answer to Canon Liddon ("*Unworthy of Eternal Life*"), quotes from Coleridge (without a reference): "I am confident that the doctrine (of Conditional Immortality) would be a far stronger motive than the present: for, no man will believe eternal misery of himself, but millions would admit, that, if they did not amend their lives, they would be undeserving of living for ever." Emmanuel Deutsch declared in his famous Article on the *Talmud:* "There is no everlasting damnation according to the Talmud. There is only temporary punishment, even for the worst of sinners": *Remains*, p. 53; or *Quarterly Review* of Oct., 1867, p. 459. E. White (on p. 222 of *Life in Christ*) quotes to the same effect from Moses Maimonides.

with the similar self-evolution of other sentient beings. "The moral is no less *red in tooth and claw* than the natural world." If there were only one man on this globe, Time-limits and "Cosmic Friction" would be too strong for him. "He would have to choose among a variety of possible purposes and satisfactions." For: "more interests exist [even in one centre of sensation] than can coexist in harmony". And, "some part of the ideal needs to be butchered": said William James in his *Will to Believe* (202). Excellence and Equality are mutually exclusive. Equality is only another name for Stagnation; and Stagnation is only the prelude to Degeneration and Putrefaction. Variety is Life, and the Joy of Life. The drab dead level is the greedy grave of all that is great and good. Upward evolution is one long-drawn illustration of the Maxim: Quality before Quantity. The sound Aquinian principle: *Imperfectiora sunt propter perfectiora;* II-II, Q. 64, A. 1: has a much wider scope than the Pre-Darwinian Thomas was capable of conceiving. Differentiation of higher from lower is the fundamental condition of all natural progress; even as classification is the necessary framework of all scientific knowledge and practice. Just so, in human society, progress is the conscious cultivation, and justice the reasoned recognition of multiform inequality. In the Science and Art of Adjudication; multiform classification, minute gradation, and Proportionate application, are the factors and vectors of all right dealing with Persons as well as Things.

(*b*) Equality is not Equity: not even English Equity. The contradictory formula in common use is a truncated and misleading version of the real principle: just like the older maxim, *Exceptio probat regulam* (*in casibus non exceptis*), explained in Note 71 *supra*. The cases cited in the Textbooks show that, "circumstances being substantially equal," must be understood as part of the abbreviated formula: Equality is Equity. So understood, the maxim is a simple deduction, obviously implied in the wider Aristotelian postulate: Proportion is Justice.[122] Indeed, Eady, L.J., says, distinctly (in Lord Halsbury's *Laws of England*, XIII., 69), that: "Equality in this connexion does not mean literal equality, but proportionate equality". This meaning is particularly clear in the Equitable presumption against joint-tenancy,

[122] Compare Martineau: *Types of Ethical Theory*, Part II., B. 1, ch. 6, § 11: "What then is this love of Justice? The love of *proportionate treatment* of men and their character according to their worth." In regard to Aristotle on Justice, Equality, and Proportion, refer to *What is a Person* (MIND, July, 1817), § 13 (*c*).

which involves literal equality; and in favour of tenancy-in-common, which allows of unequal shares: as in the case of unequal contributors to a fund for purchase.[123] Among Greeks and Romans, *Aequitas* or *Epieikeia* signified: the restoration of a balance (or *status quo ante*) disturbed by force, fraud, or the fatuous application of a general legal rule: not interference with prescriptive possession, or disregard of natural differences resulting from natural growth (either physical or economic). The Process of *Restitutio in integrum* was the highest expression of Praetorian Equity.

29. "Man is a bridge, and not a goal."[124] Notwithstanding the holy horror of Professor James Ward,[125] and Sir Oliver Lodge, it is just and necessary, that some men should rise on stepping-stones of other men. All the analogies of Nature[126] are against their crowd-cavil; and all the lessons of History. The Lower Man was made to serve the Higher Man, as clearly as collie-dogs were made to serve shepherds. In no other way, than some degree of involuntary human subservience (under whatever shape or name), can the higher types of men come into existence or secure perpetuation. Three generations of moderate leisure may be needed to make a family gentle. But one generation of rough work in coarse company has often been enough to unmake it. Cattle and horses cannot lift men, or keep men, very far out of the ruts of barbarous equality. The pyramid is the only stable form of elevated structure, in which a civilised nation can be built. Savage sterility must ever be the consequence of acting on Kant's Practical Imperative: Treat a man always as an End, never as a Mean.[127] Subservience of other men, preferably of the present lower races of men, whether by way of conquest, legislation, or economic compulsion, is essential to the development of refined wisdom and high-minded goodness; and to every considerable achievement in Art, Literature, and Science. Briefly, you cannot have culture without respectful and obedient servants: enjoying a

[123] See *Lake v. Gibson* (1729), in White and Tudor's *Leading Cases in Equity*, for a full discussion.

[124] Nietzsche: *Zarathustra*, 56 (3), p. 241.

[125] Ward's *Realm of Ends* (2nd edn.), p. 451. Sir O. Lodge sneered at Nietzsche in the same way, in a letter to *The Times* about twelve years ago: probably not for the first time.

[126] You cannot raise a mound without somewhere scooping a hollow. And a wide level must always be a low level. For, the total quantity of matter cannot be increased; and it cannot even occupy a greater space, without undergoing a gaseous degeneration.

[127] Kant: *Metaphysic of Ethics*, II., p. 42, in Semple's Translation; p. 47 in Abbott's.

supercanine happiness in faithful and cheerful subordination to anthropines more capable of high development.

(*b*) The greatest genius of Historical Jurisprudence concurs with the greatest genius of Semitic Learning,[128] in declaring that: "all civilisation is the work of aristocracies": that is, of races, classes, or families, born and bred in command of human services. "The Greek view of life:" says Gomperz:[129] "was at all times aristocratic." "For to me," said Herakleitos,[130] "one is (more than) myriads if he be the best." And, "History will continue to be a sound aristocrat": as D. F. Strauss[131] wrote in his mellow maturity. In the sober words of the Great Expounder of Evolution: "The presence of a body of well-instructed men, who have not to labour for their daily bread, is important to a degree which cannot be over-estimated; as all high intellectual work is carried on by them, and on such work, material progress of all kinds mainly depends, not to mention other and higher advantages".[132] No flimsier bubble was ever blown, even at a Burns Festival, than Lord Rosebery's oracle at Ayr in 1910: "Poverty produces masterpieces, and wealth smothers". It is only exceptionally true of mere Literature; and is quite untrue of History, Philosophy, and every kind of Science.

[128] Renan: *Caliban*, IV., 4; and V., 1. Maine: *Popular Government*, p. 42. Germans, I admit, would put Savigny or Von Jhering before Sir Henry Maine: and Frenchmen, Fustel de Coulanges. But none of these was a Democrat. Renan says elsewhere; (*On Channing*, near end): "The loftiness of a civilisation is usually in the inverse ratio of the number of those who share it. Intellectual culture begins to cease, at the moment when it is anxious to spread. The crowd pouring into cultivated society almost always depresses its level."

[129] Gomperz: *Greek Thinkers*, vol. iii., p. 417.

[130] Fragment 113 in the *Reliquiae* of Herakleitus, edited by Bywater (1877), and well translated by Dr. Patrick of Iowa (1889).

[131] D. F. Strauss: *The Old Faith and the New*, § 80, p. 327. The general principle has been well expounded by Paul Elmer More: *Aristocracy and Justice* (1915). Mallock's cogent *Aristocracy and Evolution* deals with the eminence of individuals rather than classes. Compare Emile Faguet: *The Cult of Incompetence*. And A. Christensen: *Politics and Crowd-Morality*. A similar contention runs through Le Bon's *Psychology of Peoples*: especially I., ch. 4; and IV., ch. 3. "Equality carries inferiority in its wake; it is the dull oppressive dream of vulgar mediocrities," p. 200. "The inevitable effect of civilisation is to differentiate individuals and races," p. 232. "The initiation of all wise and noble things comes, and must come, from individuals": said J. S. Mill in the noble Third Chapter (On Individuality) of his masterpiece, *On Liberty*, p. 119.

[132] Darwin: *Descent of Man*, Part I., ch. v., pp. 207-208 in vol. i. of the enlarged second edition (1888). Compare Aristotle: *Metaphysica*, I, ch. 1 (p. 981*b*, l. 20): "The sciences . . . were discovered, and first in the places where men first began to have leisure".

Wealth, in moderation, does really foster intelligence and virtue;[133] when it does not fall into the unfettered hands of the immature. "Refinement is only possible where leisure is possible."[134] We might have had no Milton, no Gibbon, and no Bentham, if their fathers had not been able to free them from sordid cares. Science is the fruit of leisure, as Nietzsche continually insisted. And Genius can do little but snatches of lyric poetry, without visible tools to work with, and ample materials to work upon.

(*c*) Men of Genius, whatever their origin, are seldom overlooked in an aristarchian community;[135] and only in such a state of society, is there a possibility for them to follow Wordsworth's ideal of plain living and high thinking, in Aristotle's "noble leisure". What could Priestley have done, without the resources of Lord Shelburne? Or Copernicus at Frauenburg, without the patronage of his uncle, the Prince-Bishop of Ermeland? Or Kepler, without the accumulation of astronomical facts and figures by the Danish nobleman Tycho Brahe? Or Joseph Scaliger, the Prince of Scholars and Grand Reconstructor of Ancient Chronology, without his long generous courteous protection by the Huguenot House of La Roche-Pozay? Laplace was the son of a peasant-farmer, but was very soon taken up by powerful patrons, and had enjoyed many years of comfort before his best work was begun. The genius of Lamarck, like Hume a gentleman of long descent, was (like Hume's) greatly fettered for many years by his poverty; and might have remained ineffec-

[133] O. W. Holmes in his sanest period framed a social scale of Religion and Virtue; in which he placed first "the comfortably rich," and then "the decently comfortable". The very poor, he said, were apt to be immoral, and "the very rich to be irreligious": *The Professor at the Breakfast Table*, V., near the end.

[134] W. Bagehot: *Physics and Politics*, p. 73. Ladies and gentlemen are not made by "rich table and soft bed," fine raiment and elegant equipage; but by the habitual command of intelligent service.

[135] Burns himself had no excuse for complaint. The Nobles and Gentles of Scotland subscribed a thousand guineas for the second edition of his Poems, and treated him as a man of distinction. But they soon grew sick of aiding and entertaining a wasteful arrogant rake, who responded with scurrilous ingratitude. Many other men of genius or practical power got a friendly help to fame, before Britain was cursed with compulsory education at other people's expense. We have now had free (or nearly free) general instruction for half-a-century. And where is the man of genius who has come out of a rate-supported school? Or the man of broad and massive mind, who has made any conspicuous contribution to the happiness or enlightenment of the world? On the other hand, our indispensable good cobblers and good carpenters are locally almost as scarce as good cooks, because every bouncing Board-school Brat sighs for a soft superfluous job, as Labour Leader and eventually Cabinet Minister.

tive but for the aid of Count Buffon. Cavendish, the Father of Chemistry,[136] was the wealthy grandson of the second Duke of Devonshire; and Boyle, the Grandfather, was the well-endowed son of the first Earl of Cork. Lyell and Darwin, the two most effective revolutionary minds of the Nineteenth Century, were easy-living country gentlemen. And Newton's patrimony would have sufficed for his entire devotion to high thinking, even without the resources of Cambridge. Alexander did less for the world by imposing Hellenism on Egypt and Western Asia, than by securing freedom of speech and the sinews of research to Aristotle; the Great Father of all Pragmatism; and the one man who has truly and effectually: "taken all knowledge to be his province".[137]

[136] Sir W. Ramsay, K.C.B.: *Essays Biographical and Chemical*, p. 41.

[137] And we have to thank the Macedonian Conqueror for the spacious Athenian garden, where Aristotle trained Theophrastus to become the Father of Botany.

III.—WHAT FORMAL LOGIC IS ABOUT.

By F. C. S. Schiller.

'What *is* Formal Logic about?' the intelligent reader may well repeat after perusing Dr. Arthur Mitchell's article with this title in No. 104. And the logician may well exclaim, 'If this is what Formal Logic is about, save me from my friends! If it is true that "the state of logical matter and method has always been confusion," that "logic is indeed the most ill-conceived, disorderly—in short illogical—of the sciences" (p. 431), and that its "Law of Identity" is composed of "absurd tautologies" (p. 440), is not the confusion worse confounded by such a defence?' Nevertheless it ought to be gratefully recognised by the recent critics of the logical tradition that Dr. Mitchell's paper is the sole systematic, serious, and sustained attempt there has been for many years to explain the nature and to uphold the scientific status of Logic against modern objections.

It is therefore as a genuine contribution to the question about the meaning of Logic that I wish to comment on the essential parts of Dr. Mitchell's article. I propose to show (I.) that Dr. Mitchell is a complete and utter *Formalist* in the derogatory sense I have endeavoured to attach to this term, (II.) that though he professes to recognise the problem of *Meaning*, which I regard as the central crux for Formal Logic, he does not understand what I mean by 'meaning,' and so neither solves nor even faces my problem, (III.) that the meaning *he* gives to meaning is untenable, and leaves Formal Logic just as 'meaningless' as before, and (IV.) that the notion of Logic he finally arrives at would give Logic a veto on the progress of knowledge and would more than justify the harshest things that have been said about this alleged science.

I.

The readers of my *Formal Logic* will possibly remember that the single source to which I traced all the failures, obscurities, and incoherences in the traditional 'logic' was its

'Formalism'. By this I meant that in consequence of its injudicious attempt to consider the 'form' of reasoning in abstraction from its 'matter' it had been compelled to abstract from meaning altogether, and to make itself a *literally meaningless* science. The first step to be taken in reaching the standpoint of Formal Logic was, I showed, to dismiss the judgment from logic by taking it out of its context in actual thinking and reducing it to a 'proposition,' capable of preserving an identical (*i.e.*, verbal) form irrespective of the time, place, and circumstances of its use, and the purpose and personality of its user. By this fatal abstraction the *meaning of the words* ('dictionary-meaning') was substituted for the *meaning of the man* who made the judgment. This substitution had the apparent advantage that the meaning of the words is permanent and relatively stable, and should be interpreted as a recognition of the truth that it is in consequence of this stability that the words can serve the purpose of conveying the personal meaning which employs them. But it is tempting to construe the words as a form with a *fixed* meaning, which is independent of its use or application, and to this temptation Formalism yields. The form can then be made to exhibit certain formal characters which it can be alleged to preserve throughout, irrespective of its use. These formal characters will then validate the abstraction from personal meaning, and may be made the basis of a special science, Formal Logic, which will naturally claim to be of so fundamental a character as to condition and control all the other sciences. The Formal Logician can then boast that he is dealing with 'the science in the sciences' in the words of the Scholastic[1] definition of logic which Dr. Mitchell, repeatedly (pp. 430, 435) but incorrectly, attributes to Aristotle, establish himself in a position of superior dignity, and save his face.

It was my aim to show that this whole line of reasoning was entirely mistaken and utterly illusory. Accordingly I insisted that the moment the meaning of a judgment ceased to be personal, so soon as the words were severed from the occasion of the judgment, real (actual) meaning was destroyed, and logic was reduced to futile speculation about potential meaning. The forms became (unmeaning) 'forms-for-meaning,' and infinitely 'ambiguous'. Moreover the vital distinction between truth and error was lost, because as a mere matter of form there could be *no* 'false' propositions. Every proposition formally claimed to be 'true,' and had therefore to be treated as true, if it was 'extra-logical to go behind

[1] Hamilton ascribes it to Scotus.

the form. But inasmuch as it was notorious that errors existed and fortunate that they and other false truth-claims might be found out, the result of this paradox was to generate the notion of 'formal validity,' and to separate it from that of 'truth'. Accordingly, 'validity' might be possessed by 'judgments' (propositions) that were actually (materially) false. Henceforth the notion of 'validity' usurped the place of truth in Formal Logic. The abstraction from material truth and devotion to validity, however, which are the essence of Formal Logic, though they are *prima facie* possible abstractions, did not in fact lead to a valuable science. A logic indifferent to the difference between the true and the false could not in fact be of any use to any science or capable of guiding conduct.

Moreover the assumption that the formal characters of a proposition were unaffected by the occasion of its use turned out to be false. This assumption had to be made by Formal Logic, because without it it was impossible to maintain the difference between a 'fallacy' and a 'valid' form. If, *e.g.*, the same form of words might be a 'valid syllogism' or an 'ambiguous middle' according as it was applied to one case or to another, the whole value of the notion of validity was clearly undermined. Yet it has repeatedly been shown (most recently in No. 104, pp. 462-464) that no form, from the syllogism downwards, could provide a formula that was universally true, in the sense of yielding a valid result in all the cases to which it might be applied. The proper inference from these disconcerting facts is, of course, that it is only the *unused* form which is 'valid'. To be made absolutely valid therefore a form has to be made inapplicable. And this is what in fact Formal Logic has done to its forms. But it has not said so. Nor has it seen that what is wholly inapplicable is unmeaning. Hence, once more, Formal Logic is revealed as a science of the meaningless.

From this analysis of the situation several convenient tests of Formalism may be derived. Any view is Formal, if (1) it abstracts from the context of a judgment and substitutes a 'proposition' (or 'propositional function' in Mr. Russell's terminology), or (2) if it ignores the distinction of truth and error.

Judged by these tests Dr. Mitchell is revealed as a thorough Formalist throughout, who can think of no cure for Formalism but more ruthless Formalism. His Formalism comes out most clearly, perhaps, in his account of meaning. "Any and every discourse" he tells us (p. 437), "is objective without a doubt." "Every meaning is public and

common." This clearly disregards truth and error, and is a flat contradiction of the view, that every meaning is primarily personal, and becomes 'common' only when it has been communicated effectively. Again, "the world of meanings, which is the sphere of logic, is evidently everything whatever, the entire universe of being" (p. 438). So it must evidently include all errors as well as all truths: indeed the distinction must be unmeaning from this peculiar point of view. Dr. Mitchell seems as complete a Formalist as it would be possible to find.

II.

This is not however to prove that he is wrong. Even though Formal Logic abstracted from the all-pervasive distinction of 'true' and 'false,' nay from meaning (as I conceive it) itself, it might conceivably be a good and valuable science. For do not all sciences make abstractions and consider separately aspects of reality that are not found separate in nature? Who would argue that *e.g.* Geometry was not a good science, because *bodies* are always more than *shapes?* Accordingly the Formal logician confidently appeals to the analogy of mathematics to parallel his abstractions and to vindicate his proceedings.

But the real issue is whether this analogy suffices to show that the abstractions of Formal Logic are good ones; for there may be abstractions which are bad and futile, and lead nowhere. That the mathematical sciences make abstractions is admitted; also that they are good abstractions, and work. But does it follow that the abstractions of Formal Logic cannot be bad and unworkable? That the abstractions of mathematics are of an extreme sort is not in dispute. But is this as such a merit, or a justification of Formal Logic, or a relevant analogy with Formal Logic? The abstractions of mathematics are not valuable because they are extreme, as Dr. Mitchell appears to think (*e.g.* p. 430), nor are those of Formal Logic still more valuable because they are extravagant. The abstractions of mathematics derive their *value* (together with their *relevance* and *meaning!*) from the empirical fact that they are *useful*, because they are extensively *applicable* to very general aspects of reality; or otherwise, because of all the suggested ways of treating these aspects they have turned out to be the *most* applicable and convenient. But here comes the essential difference. The abstractions of Formal Logic are accused of *not* being applicable to reality: they are challenged, not because they are not extreme, or general, or consistent, but because they are not *valuable*. It

is admitted that they are thinkable, and even in a way obvious, but it is denied that they are serviceable. And the reason given is that they are not *applicable* to the other sciences, to actual thinking, and to actual meaning. This charge is no aspersion on the scientific method of abstraction in general, though it does impose on the advocates of Formalism an obligation to show *specifically* that their use of the method has resulted in making Formal Logic a useful science. Until they have shown this, no general analogy between Formal Logic and mathematics helps them in the least.

We see then that for an abstraction to make a good science it has to be made applicable; if it is inapplicable it is worthless. And the Humanist charge against Formal Logic is precisely that it rests on an abstraction which renders it inapplicable to all actual thinking. It is essentially an abstraction from Meaning.

It is in meeting this charge that Dr. Mitchell very definitely breaks fresh ground. He is, so far as I know, the first Formal logician who has seriously and explicitly noticed the fact of Meaning and tried to treat it Formally, and, therefore, whether his doctrine is right or wrong, it is an advance in Formal Logic.

The value of this advance is however somewhat seriously discounted by the facts that in vindicating Meaning for Formal Logic he completely formalises it, uses the term in a different sense from that upon which the charge was based, and has not, unfortunately, understood this sense. He supposes humanist logic to mean by 'meaning' something which is *merely* a process and entirely 'subjective,' so as to leave room for a formal treatment of the objective factor. "Granted" he says, "that a meaning is necessarily meant by somebody in particular; granted that, as part of the content of somebody's consciousness, a meaning is subjective: still if nothing is a meaning unless it is meant by somebody, neither is anything a meaning unless it means something; and this is to say that, if a meaning has subjective content it has also objective content" (p. 437). The concession seems a handsome one, and one is grateful even for small mercies from logicians; but it is not nearly enough: the argument is irrefragable, but irrelevant to the charge. For the demand for a recognition by logic of actual reasoning is not only, or mainly, a demand for the recognition of a subjective factor in knowing; it goes a great deal further. It goes on to claim that the personal is not merely subjective but also objective, or rather that the 'objective' is always intensely personal when it is

fully analysed. Indeed it stands to reason that if the personal aspect in meaning and knowing were merely subjective, it would be unimportant and might well be abstracted from, as dream-life and delirium are habitually neglected; for it would not then establish any connexion between one knower and another. A merely subjective meaning could not be communicated. But actually personal meanings are much more than this; they are often communicable and always thoroughly objective. Personality is not merely a *conditio sine qua non* of the genesis of objects, but the motive, aim and *raison d'être* of the processes by which logical objects come to be. Interest, purpose and selection are essentially personal and universally pervade all thinking. They are the very soul of 'objectivity,' for they determine the meaning and function of all the terms that occur in thinking. 'Objects' are the creations of these personal forces, and 'common' objects are the expressions of the confluence of concordant personalities. For when we look closely we see that all 'objects' are *selections*, taken out of an indefinitely larger continuum for some purpose, and necessarily relative to the personal interest which has distinguished them. Should this interest be felt by many persons, it will engender 'common' objects of a wider validity, if by few, of a less.

Thus all men probably are sensitive to cold and hunger, and so no one disputes their 'objectivity': but some are colour-blind and this renders colour more subjective, while comparatively few are musical or mathematical, and this restricts the realms of music and mathematics to the elect: if all but one were colour-blind, would not colour seem entirely 'subjective,' and the one who saw colour a visionary or an impostor?

We conclude then that Dr. Mitchell's concessions are insufficient, and that he has not grasped the full logical effect of the recognition of personality nor the essentially personal nature of meaning.

III.

His own notion of Meaning seems open to serious objections. (1) It is entirely Formal, and does not go beyond the formal relation of a thinker to the object thought, a relation which may be traced, of course, in any thought and any object, true or false, successful or futile, actual or potential. It is only such a Formal view that can be content to say (p. 437) that "a meaning state of mind *presupposes* something meant, by the necessity of its own nature," and that a reference to something "other than the act of meaning it"

is all that is required for objectivity. No doubt, if that is all, "any and every discourse is objective," even "a fairy tale or fantasy"; for to such 'objectivity' the distinction between truth and error must be utterly irrelevant. But to mean no more than this by 'objectivity' is to make it nugatory. Moreover it is difficult to see how there could be 'subjective' meanings on this theory. How could even the most random assertion, the wildest absurdity, the most patent lie, fail to be 'objective' in this sense? To be 'subjective' in Dr. Mitchell's use, they would have to identify "relatum and referent," and where is there to be found a form of assertion which *formally* does this? On the other hand, what is the value of an 'objectivity' conceived so widely that it embraces all such rubbish, and makes no attempt to *sift* the true from the false, the valuable from the worthless, sense from nonsense? Surely Formalism comes too cheaply by its 'objectivity,' and offers the sciences a tool not one of them can afford to use without committing suicide.

(2) Dr. Mitchell's notion of Meaning is infected with *passivism*. He describes meaning as essentially a *static* relation, and recognises in it no activity or volitional process. Meaning is a stable relation of the mind to 'objects,' which lie about inertly in the intelligible world, waiting to be 'presupposed' by a meaning-process which happens to light upon them, and so establishes the aforesaid 'relation'. But they are intrinsically quite *indifferent* to what happens to them; whether they are the *right* objects or wrong 'uns, whether they are true or false, affects neither their nature nor that of the mind nor that of the relation; it belongs only to that 'subjective' side of meaning which means nothing to 'logic'. To the Humanist, on the other hand, the 'objects' he means are not 'presupposed,' because they do not *pre-exist* as such. They are not objects he *starts from*, but objects he means to *get to*. His meaning no doubt always refers to an 'object,' but neither he nor the object nor the relation is ever anything fixed and rigid. In the meaning-process all three change and develop. He *learns*, the object becomes *better known*, and the relation *more satisfactory*. Thus the final object is in a sense a creation of the meaning-process which has selected and determined it and used it to achieve its end.

(3) Hence no part and no term of the process can properly be described in other than dynamic and volitional terms. Meaning is not a *state* but an *act*, not a fixed relation between inert terms, but an activity and an *attitude towards* the continuously developing situation which evokes it. As such an act it is *purposive* throughout all its developments,

and always more or less *tentative* and willing to undergo modification in order to attain its aim. In actual meaning we have always to feel our way. Hence in every process of knowing our meanings *grow*, and we have always an interest in their success, and strive to avert their failure. From the point of view of actual knowing, then, what could be more preposterous than to abstract from the vital question whether our meaning *actually attains* the end, 'object,' or 'objective' we aim at? To tell us that we always aim at an object is not enough. For to *aim* at an object is not to *hit* it, and we want to know whether we succeed. Now it is notorious that our thinking often misses its mark, that the object meant is not reached by the meaning-process, and that the object attained is not relevant to our cognitive purpose. Surely only infirmity and feebleness of purpose can console itself for missing one object by hitting another! Nevertheless such failure does not affect the reality of the meaning, though it detracts from its value. The meaning formally exists as much as the *right* meaning, though it happens to be a *wrong* meaning. But does not the *logical value* of the meaning-process reside precisely in this difference of 'right' and 'wrong'? Is not the refusal of Formal Logic to evaluate this difference, the arrest of analysis at the formal existence of meaning-*right-or-wrong*, really a refusal to consider the *value* of thought, to advance to the logical level, and an arrest of inquiry on the level of psychological description? And is it not humorous that the lofty pretensions of Formal Logic should fail so signally to raise it above the level of the 'psychology' it despises?

If logicians could be induced to study the *failures* of meaning as well as the successes, it would further become apparent to them that the meaning-process is always and essentially purposive and volitional. For it is precisely in such cases of frustrated effort, where the object meant is *not* attained, that the consciousness of meaning grows most intense. Who has not suffered agonies from inability to utter an elusive meaning hovering 'on the tip of his tongue,' say a forgotten name, which he 'knows perfectly well,' about which he remembers dozens of particulars and which he could pick out from among a thousand, if only he heard it? On Dr. Mitchell's theory this condition would be incredible. For there is no inert object here, easily apprehended by an inerrant thought, but in the place of the object we have an intensely active aching void which breaks the successive waves of meaning and shatters their assaults.

Any account of Meaning then which ignores its activity,

its purposiveness, its struggles to achieve success and to escape failure, is nothing but a *fiction*, and a futile travesty of actual meaning.

IV.

But even if we waived our objections to the gross psychological misdescription which the Formal logician's account of Meaning has been shown to involve, should we have got to serviceable fictions or abstractions, to anything the sciences could use, or even tolerate?

It would seem that the answer to this question must be—*No!* For what we should really have done would have been to pledge ourselves to take as an absolute and paramount truth the convenient fiction which we may denominate the *Fixity of Terms*, and we should then find ourselves committed to such reverence for it as would make the progress of knowledge illegitimate and inconceivable. As Dr. Mitchell rightly says (p. 447), "the sole business and interest of the formal logician" would be "analysis of the given relational combination of concrete experience," and he would have "no legitimate regard for any patented method of investigation" which might be needed by epistemology, metaphysics, psychology or medicine.

In this account of the attitude which Formal Logic should assume towards the sciences the sting lies in the '*given*'. Everything must be '*given*' before logic begins to 'analyse'; the *getting* of knowledge does not interest or concern it. 'Logic' is essentially an *ex post facto* analysis of knowledge *already acquired*, which rearranges it according to certain technical assumptions and 'presuppositions' of its own; it is emphatically *not* an attempt to describe and evaluate the actual processes of acquiring, testing, and assuring knowledge. The sciences however are all interested in the *getting* of knowledge; they all (with the possible exception of theology) conceive their knowledge as *capable of progress*, and aim at extending it. Hence they simply cannot afford to conceive the Fixity of Terms as absolute. It cannot be for them more than a *methodological fiction* relative to the need of conveying an initial meaning, as a basis for inquiry. They recognise, in other words, that every inquiry 'presupposes,' *i.e.* requires, a certain preliminary definition of terms, sufficient to delimit its purpose, meaning and scope, and that absolutely fluid terms would not serve this purpose, because they could not convey any one's meaning. But this preliminary fixation is never conceived as a bar to the development of scientific meanings and to the reconstruction of

definitions: as the meaning-process proceeds and the new knowledge accrues, all the terms involved are modified and enriched in every science.

The reason is plain, and psychology reveals it. It is *psychologically impossible* that any one should make a *real* judgment, except with the idea and purpose of conveying thereby some *new* truth. For no one is so fatuous as to wish merely to rehearse a truth that is already known and understood by all. It follows that the logician, if he has any ambition to describe actual thinking, must declare that it is the aim of every logical judgment to some extent to *alter* the meaning of the terms it uses. Whatever the terms involved in the judgment may be, its subject and its predicate would not be combined unless a certain *novelty* emerged from the combination. And this novelty modifies the meaning of *both*. For if the judgment is real (and of course the 'judgments' contemplated by Formal Logic never are), "it establishes a new and previously unknown relation between its subject and its predicate. '*S*' is henceforth an *S*-which-can-have-*P*-predicated-of-it, and '*P*' a *P*-which-can-be-predicated-of-*S*. Thus both the psychological associates and the logical associates of *S* and *P* are changed."[1]

Now the unforgivable sin against the spirit of truth of which Formalism stands convicted is that it refuses to recognise novelty, change, growth, progress, purpose and value in the realm of thought. True, its refusal sprang originally from an apparently trivial and venial misconception about the methodological principle of the Fixity of Terms. But when its error develops its appalling consequences it perversely refuses to correct it, and clings obstinately to its false assumptions. Rather than conceive its principle as methodological and relative, it attempts to ignore actual thinking, to construct elaborately technical pseudo-sciences out of impossible and inapplicable abstractions, and to arrest the progress of every science that is blind enough not to see through its pretensions or weak enough to tolerate its tyrannical dictation. This then is what Formal Logic is really about, and is why it seems necessary to show that Dr. Mitchell is quite as unable to conceal its scientific futility and malignant influence as any of the earlier apologists for Formal Logic. To make it more consistent is not to make it better but to make it worse; to make it wholly consistent, is impossible. But were it possible it would be to make it wholly absurd.

[1] From 'Scientific Discovery and Logical Proof' in *Studies in the History and Method of Science*. Oxford, 1917, p. 246. *Cf.* also *Formal Logic*, ch. xiv., § 4.

IV.—THE BASIS OF BOSANQUET'S LOGIC.

By L. J. Russell.

A.

We may begin with an attempt to state the fundamental propositions on which Bosanquet's views are based. As always in dealing with a system whose various aspects are closely interdependent, it is not possible to arrange them deductively; but it is possible to see certain large points of view which act as guides in the consideration of the different problems which arise on the way.

I. Perhaps the widest of these is the view that "all judgment is a definition of real reality".[1] In one sense, the whole of the Logic is a commentary upon and explanation of this sentence. Exactly what is meant by "real reality," and how the various judgments whose subjects do not as such exist in space and time can be said to define reality: these are large and complicated questions, not to be discussed in a preliminary account. But one point may be noted here, in its positive and its negative sides. What actually exists in space and time, being that with which our experience begins, and of which our knowledge is in the main the interpretation and organisation, is, though not reality itself, yet the nucleus of reality. Or, to vary the metaphor, it is the touchstone of reality. Not everything real has the form of actual existence; but a reference to actual existence is involved in everything real. Without this reference, however indirect, judgment wanders. And in consequence, we have the principle of great importance, stated in the form, "The subject is taken as possessed of that kind of reality of which it is capable,"[2] and more clearly elsewhere, "The reference to actual existence is presupposed in the sense possible for the subject".[3] This is the positive side; its nerve consists in the fact that since reality consists of individuals, hence wherever a subject is an individual, or presupposes an in-

[1] *Logic*, 2nd edition, i., 227, *cf.* i., 142, n. *a*.
[2] I., 139, with a qualification we need not here consider. [3] I., 224.

dividual, there the reality of the subject is presupposed; and whatever degree of individuality is possessed by the subject, a like degree of reality is presupposed. And "degree of reality" involves capability of connexion with actual existence. The negative side is of the greatest importance; for it refuses to allow us to attempt to construct an individual of such a sort as cannot exist, *i.e.*, does not satisfy the concrete conditions of actual existence, and judge about it. The more successful we are in our construction, the more false our judgment becomes. "We can only escape from this result if the fancied content is such as is in its logical nature debarred from being real, *i.e.*, a mere abstraction, and is therefore incapable of claiming to stand for a reality."[1]

II. The second principle concerns necessity or universality, and is complementary to the first. Every judgment exhibits necessity, and necessity rests on the nature of a universal. A universal is an identity in difference. There are universals because there are wholes with characteristic structures which bind the parts into a totality; the necessity in judgment rests on insight into the way in which the nature of such a totality is exhibited in all its parts—links part to part within the whole, and assigns to each part its place in the whole. Now various wholes can have the same characteristic structure, which, however, is manifested differently in the different wholes; and a judgment based on the characteristic structure as exhibited in one whole cannot be transferred without adaptation to a different whole with the same characteristic structure. Or, as it may be put, a universal can never be given once for all, to be reasoned upon, and have consequences deduced, formally. The result is to reverse an old view. "Logical" does not mean "formal"; rather it means "material". Let us suppose that you could construct a concept, and deduce various consequences about it. Then your consequences would apply to reality wherever your concept held without alteration or modification. But on account of the very nature of a universal, this would, in theory, nowhere be the case. Such a judgment would give what Bosanquet calls generalisation by mere determination, or formal generalisation. Whether it applies to reality, and where it applies, are questions it leaves undetermined. It is abstract, and as claiming by being a judgment a completeness it does not justify, untrue. Here we see the influence of Bosanquet's view of judgment as a definition of reality.

But this is not all. The very nature of a universal makes

[1] I., 227.

any such construction of an abstract concept—where entities and relations are lifted bodily from concrete conditions and treated in themselves—theoretically impossible. In concrete experience you are not dealing with abstract terms and relations *plus* concrete detail. In investigating characteristic structure it is not as if you were trying to discover the nature of an object by looking at its several reflections in various distorting mirrors. There are concrete wholes; and these alone are the reality with which we have to deal, and of which our judgments endeavour to speak. And while we can discern the characteristic structures — the universal natures—of these wholes, our discernment is strictly relative to the wholes themselves. In so far then as we deliberately abstract from concrete detail, we are applying to partial wholes what we have discerned of concrete wholes. The grounds of our judgment, and the subject of our judgment, do not fall together.

In consequence then of the very nature of a universal, no judgment can be complete which is not based on an analysis, not merely of the formal nature of wholes, but of their material conditions. This analysis is necessary not merely to determine the judgment itself, but also to determine its range in and conditions of application to reality—an essential part of every judgment.

Here we have two results. (*a*) Which follows simply from the nature of a universal: That every judgment is relative to a whole of a particular sort—*viz.*, a system which expresses through all its parts a definite nature, in the light of which the nature of the parts, and of their place in the system, can be understood. Such a system Bosanquet calls a morphological unity. "The connections thus prescribed between part and part within some systematic whole are necessary connections."[1] (*b*) That if the judgment is really to hold of reality, the system on which our judgment is based must be such as to find a place, in some form or other, in the reality which is the systematisation of actual existence.

III. These two principles give rise to the very important consequence, that every judgment has the two aspects of fact and necessity. We can get an appearance of self-completeness in a judgment, by the construction of a specific system of relations, giving rise to judgments of necessity. But here the question of the application to reality of such a system has been left out of consideration. And again, we can get hold of reality by gradually gaining insight into individual

[1] I., 135.

systems as found in existence, so as to see how their parts are related to the nature of the wholes. But here the question as to the necessity of the connexion between the whole and its parts has not been answered. Our insight has stopped with the fact of the connexion. The problem is to analyse such individual systems found in existence, into specific systems of relations necessitating the nature of the parts. And in the attempt, there is a perpetual struggle between the two aspects. "The moment thought has seized a significant idea, it is committed and must go wherever the idea carries it, in spite of the demonstrative 'this'."[1] The judgment, in other words, cannot be confined to the given whole of present perception, but depends on reality as a whole. But while a nexus of significant ideas carries us in the "groove of necessity" beyond perception, still the unexplored elements of perception drag us back, and refuse to allow that our judgment can be final. Only a whole thoroughly explored, both in its internal nature and in its contact with actuality, can give a complete judgment.

IV. This brings us to the fourth important point. A relatively complete judgment is to be found only when we are dealing with real teleology. For only there are we in touch with a system which is at once taken as real, and composed of thoroughly explored relations showing the necessity of the connexions of the parts within the system. "By real teleology I mean the embodiment or operation of a conscious purpose entertained by a human intelligence." The lowest type of real teleology is to be found in a machine made by man with a definite object; low, because the purpose does not exist in intellectual form within the machine itself. Higher types are to be found in "the phases or embodiments of man's intelligence and conscious will". In them we have "totalities which combine an explicit intellectual unity with determinate interdependence of parts".[2] In such a whole we have necessity at its best, given with "the individuality which supports it".[3]

The completeness of judgments may be estimated by the degree of their approach to real teleology. Thus the generic or analogical judgment rests on an estimate of the purpose served by a system or unity (quasi-teleology or secondary finality), and is consequently higher than the pure hypothetical judgment, "which necessarily omits the teleological or

[1] I., 126. [2] II. 190.

[3] With the judgment based on real teleology, though we have attained the highest type of ground, we have not attained completeness. For teleological systems exist within the given reality and depend on it.

quasi-teleological import which gives the content of the judgment its interest and significance for knowledge".[1]

We are now in a position to summarise briefly the conception of reality resulting from these propositions.

Throughout Bosanquet's Logic we do not find, as we find in some writers, any fundamental distinction between "being" and "existence," or between "actual" and "real". If an entity had only being, and was not in some way essential to the system of reality, that would be because it was an unreal abstraction; and any appearance it might have of serving as the basis of a true or significant judgment would be illusory. For a judgment apparently based on such an entity would, if true and significant, really be based on the concrete reality from which the entity in question was arbitrarily torn. And again, to distinguish between the actual and the real would be to encourage the false view that it is possible to separate "given fact" from interpretation or meaning. The result, then, of Bosanquet's theory is that only the real—the actual, the existent as truly interpreted—can have being in the strict sense, and can form the subject of judgment.

In determining the nature of the real, Bosanquet starts with what is given in presentation. As we are merely trying to discover his use of the word real, it will not be necessary to discuss the arguments by which he shows that the given is upheld by interpretation. But one point stands out. The real must be self-subsistent. And the given is dependent. We cannot understand it without taking into account many other facts which are different from it, as it is given. Now the given as interpreted takes us beyond a mere series of presentations inhabiting space and flowing in time, and involves a world of meanings and constructions. If we could complete the process, so as to arrive at a self-subsistent individual, that would be reality, and all constructions, all entities which were not essential to this process would fall outside reality.

Such would be the impression we should derive as to the meaning of the word reality. And I believe it represents fairly correctly Bosanquet's use in the Logic. In Metaphysics the word has a wider and more embracing meaning. For Bosanquet would hold with Bradley that, in the end, everything however abstract, however erroneous, falls in some way within reality. But the criterion of reality adopted for logical purposes will differ from the metaphysical one in being on the one hand less, and on the other hand more severe. Much must be admitted as actual or real which metaphysics

[1] I., 219.

would insist on altering before it would accept it as real: *e.g.*, space and time as exhibited in concrete existence. And many things can be rejected as unreal which Metaphysics can take in, provided they submit to correction: *e.g.*, all pure abstractions. While this is so, however, the ultimate meaning of the word must not be forgotten. But this remembrance must operate chiefly in keeping the logician humble, and in forcing him onward to the self-subsistent; it will not prevent him from radically refusing to accept as legitimate grounds of judgment anything not essential to the march toward the self-subsistent.

Thus the logician will brand as unreal all entities posited by scientific hypotheses which ultimately turned out to be unjustified, such as the Ptolemaic spheres in Astronomy, and Phlogiston in Chemistry; pure abstractions such as infinite number, or space in two dimensions; and all individuals of fiction, such as Hamlet or Clive Newcome. And because they are unreal he will refuse to admit that they can in the genuine sense be subjects of judgment. If they are granted to be subjects of judgment in some secondary sense, it will be because and in so far as they are not altogether unconnected with the real.

B.

These then are the four propositions we have noted as the most fundamental; and it is clear that the first two are really basal, the two last being consequences. In the limitative sense Bosanquet gives to these four propositions, we shall have to deny them all. Bosanquet's view of reality imposes a restriction on the sphere of true judgments which we shall be unable to accept; in his account of the element of fact in judgments we shall find a transition from "posited system" to "real system" depending on arguments which we shall have to reject; to his view of a universal we shall have to oppose a different view; and lastly, we shall see reason for suggesting that other systems besides systems of real teleology can provide sufficient ground for a true judgment.

(*a*) Touch with actuality was necessary to judgment, we saw, on account of the nature of a universal, which caused any formal generalisation firstly to be theoretically imperfect, and secondly, to remain out of touch with reality as a whole.

Let us consider the first of these points. What it must come to is this, that the exploration of a relational system must take the system in some one particular setting. Is this because the relations or entities cannot be thought of apart

from the particular setting? No, for it is admitted that they can and must be so thought of, though to think of them without any setting would in Bosanquet's opinion be to empty them of significance. It is rather because any attempt at understanding them apart from their setting must rest on an estimate (not a thoroughly grounded judgment) of the difference which would be made in their characteristics if this setting were replaced by another. Even when we take a relational system in one particular setting and attempt to estimate its functioning in that setting, our judgment is abstract; for in the first place we are not taking the system in its whole setting, and in the second place its setting consists of a mass of unanalysed conditions. And this is even more the case when we attempt to generalise, so as to make our judgment applicable through the whole range of reality.

The difficulty is to see how, on this view, any predication could be possible at all. We should not on this point, Bosanquet says, be needlessly purist. A purist logic would require every generic judgment to be "commensurate" or "characteristic". "Man breathes" would not be allowed, for other animals do so also. And the argument would be that *man's* qualities are qualified by relation to his humanity; "so that in order to represent them as features of *man* they ought ideally to have certain modifications assigned to them, while in their abstraction they can only be set down as correlative to the no less abstract idea of animality as such".[1] Bosanquet, however, is not willing to go so far. Such attributes are, he says, at least partial identities between man and the other animals. He grants that knowledge expressing such attributes is imperfect, but goes on, "The rule to be borne in mind in such cases is that imperfect knowledge only becomes false when mistaken for perfect knowledge". There is in this much to be discussed, notably the ideal which Bosanquet regards as belonging to judgment (*viz.*, to express a truth completely adequate to its subject): but we shall not deal with this here. What we have to discuss is the question of the applicability, on Bosanquet's view of universals, of the same predicate X to two systems A and B, in which X appears differently. Every predicate X is a system having its own characteristic structure, with consequences x, y, z . . . for X; and we have to ask, whether these consequences x, y, z, etc., are different for X according to the system A or B in which X falls. On Bosanquet's view of identity in difference, this must be the case; and we shall have to pursue the endless alteration of X, x, y, z, of x's, y's and z's con-

[1] I., 209.

sequences, *in infinitum*. Every predicate would thus be a veritable Proteus, which we were compelled to define by its momentary shape. Logic would be dumb before such a situation. We can only avoid this, so far as I can see, by admitting that while, when X is part of a wider system A, B, or C, it has varying consequences *for the varying systems A, B, and C*, yet its consequences x, y, and z must be the same for *it* (*i.e.*, for X) *wherever it appears*.

We have here two opposite views fraught with vastly divergent consequences. If predicates are systems whose consequences are *for them* the same in whatever wider systems they may form elements, then judgments relative to such predicates can be complete without an investigation of the precise points at which and conditions under which these predicates attach to concrete reality: hypothetical judgments can then be in a definite sense completely true. But if, on the other hand, the consequences of predicates differ (even for the predicates themselves) with the different systems within which they fall, then no judgment short of the judgment which takes in the whole of reality can be true. Bosanquet holds the latter; it follows from his account of universals strenuously adhered to; but it seems to make partial predication not merely imperfect, but impossible.

(*b*) In many of the detailed discussions designed to show the categorical basis of various types of judgment, we find it shown that every judgment involves as its ground, mediate insight into a complete system; but in none do we find anything more than an identification of such a complete system with the categorical basis involved in judgment, and in none do we find it made out (though it is often asserted) that such a system must itself be real.

Very significant in this connexion is the analogy of the picture, which is "an illustration of the ultimate nature of logical necessity or relativity and its relation to fact, which is . . . at least true in every detail".[1] Now the essence of the illustration is to point out that it is an individual whole taken as a totality or determining system, which imposes certain necessary relations on the parts in virtue of its nature. And so far, there is nothing to show that the individual whole need be anything more than posited, or supposed. The transition is explicitly made without any argument in a later passage. "In every judgment there are differences within an identity. In every judgment therefore there is affirmed a necessity based on a reality."[2] Similarly the excellent

[1] I., 242-243. [2] II., 237.

account of necessity shows only that necessity involves "mediate insight into a complete system," and not what he further insists upon, namely, "dependence on the one ultimate system".[1]

What is the basis, then, of Bosanquet's transition from the fact that an individual system is involved in every judgment, to the conclusion that hence every judgment is based on a reality? It is not simply that reality is defined in such a way that every individual is *eo ipso* identified with a reality. This would conflict with the whole treatment of reality throughout the Logic, where the nature of the actual imposes on reality restrictions which in many cases render impossible such an identification; and from these restrictions the condition results, that only such individualities as can be taken up in some way into actuality (the precise meaning of which we shall discuss later) can be fit subjects for judgments. How, then, is the transition made?

The justification of the transition is arrived at by procedure along two convergent lines of argument. One is derived from a consideration of the nature of individuality, where it is desired to establish the result that there is no complete individuality (and therefore no genuinely true judgment) short of the whole of reality (with, apparently, the corollary that except with a basis in actuality no group of relations can constitute even a partial individuality). The other is derived from a discussion of the limits of supposal, the outcome of which is that only a supposal based on actual reality can exert inferential force. And in the last resort the argument turns very largely on the simple conviction that a judgment must be based on actuality in order to hold of reality, interpreted in such a way as unduly to narrow the meaning of reality.[2] Both these lines of argument we shall have to challenge. And as the latter argument appears to us to be of central and vital importance to Bosanquet's whole position, we shall consider it first at some length. If the discussion appears too lengthy, we would urge that its complexity was unavoidable.

C.

A judgment which was completely true would, on the view we are discussing, be one whose subject was accepted in its entirety, and without any reservations, by reality (reality considered as the complete whole to which we are led in our

[1] II., 223-229.

[2] This narrowing of the meaning of reality is essentially involved, I think, in developing along the lines of Bosanquet's Logic the view expressed *e.g.* by Bradley (MIND, N.S., 60).

attempts to understand what actually exists). For only the real can provide a satisfactory ground on which to stand in deducing consequences. But, the view insists, on the level of imperfect judgments—and all our judgments are imperfect—we can depart from complete reality, and yet be said to judge in a strictly philosophical sense. Our judgments, though not possessing complete truth, have yet the marks of genuine judgments. Of these incomplete judgments, the ones most important for the purposes of the present discussion are the lowest types, hypothetical judgments: those namely dealing with abstract relations, and, closely connected, those dealing with supposals. Clearest cases of these are to be found in Mathematics and the spheres of knowledge based on Mathematics. The result which emerges from Bosanquet's discussion is this. What we need as the subject for judgment is some totality, possessing parts whose characteristic nature is structural, *i.e.*, subordinate to the nature of the whole. And some numbers, and some figures in space, while not actually existent, while abstract, appear to possess just the required nature.

In what way, then, must connexion with reality be maintained in such judgments? Bosanquet sees this question clearly. In what sense, he asks, are abstract numbers and figures actual?[1] It cannot be answered that they exist merely as present in the individual mind. Nor are they actual in the way in which "material things or their sensible qualities" are actual. Their selection (*e.g.* that of a typical ellipse—for not every figure, nor apparently every number, is regarded as having this totality) is arbitrary, involving a subjective quasi-teleology, and is thus not justifiable on purely geometrical (or numerical) grounds. Even if space is accepted for logical purposes as having "a peculiar actuality of its own," still this is not so clear of geometrical figures. "They are not the shapes of actual objects; they are not identical with any perceptible figures; they are not distributed through space nor present as special characteristics in any portion of it." How then is reality the ultimate subject of such judgments?

The answer to the question is of the greatest importance. Such numbers and figures, he concludes, *are* real, though abstract. They are conditional, "but within a world which itself can be predicated directly of the reality with which we are in contact by means of perception". If it is urged that they are only possibilities, the reply is, that they "are at least *real* possibilities, that is to say, their fundamental generating

[1] I., 181 ff.

relations actually exist in the world which centres in present perception".

We have then the following results. Some numbers, and some figures in space are characteristic totalities, and hence fit subjects for judgment. They are *also* real, in the sense that "their fundamental generating relations actually exist". But the further question arises, whether it is *because* they are real, that they are fit subjects for judgment. For otherwise it will on Bosanquet's view be false (as involving a false implication) that the ultimate subject of judgment, even as regards spatial figures, *must* be reality.

How then does the transition from "characteristic totality" to "reality" receive justification?

There are, as we have said, two lines of consideration, both brought out in the comparison of geometrical figures with imagined wholes.[1] In the first place, it is suggested that no imagined whole can be a truly self-sufficing totality. But if the theory of judgment depended on this point, then while Metaphysics might say that reality is the ultimate subject of every judgment, it would be better for Logic to confine itself to the statement that only a truly self-sufficing totality can be the ultimate subject of any judgment. For the discussion as to what constitutes a self-sufficing totality belongs to Metaphysics.

The main point, however, is different. Bosanquet would not hold that imaginary conceptions exist only in the minds of those who think about them. They exist rather "in the identical reference which these minds are stimulated to make to a world of meanings".[2] But in so far as this world of meanings is "*explicitly* discontinuous with and detached from the world of fact," the judgment which upholds it must be regarded as "judgment of a peculiar kind and under peculiar conditions". For if any such judgment were taken at its face value, it would refer to the actual world; but it refers really to a world which is itself only conditional. Every judgment, as Bradley taught, involves an abstraction, the justification of which depends on the world within which the judgment falls; but a judgment made of an imaginary world not merely involves this abstraction, but "is conditional within a world which itself can only be predicated conditionally and not directly of the reality with which we are in contact by means of perception".[3]

But why, we must ask, *should* we need to predicate the imaginary world of the reality with which we are in contact by means of perception? Are our judgments false even

[1] I., 183. [2] *Ibid.* [3] I., 184.

within this imaginary world unless we can do this? Here is the crux of the matter. Bosanquet would reply in the affirmative. Judgments regarding figures in space are true just because space is actual. "The subject of each such judgment is reality qualified as a structural whole which embodies properties rooted in an *actual* relation and controlling the consequences of that relation at every turn." Where this control by actual relations is lacking, judgment proper is lacking.

This is brought out more clearly in the discussion regarding supposal. On Bosanquet's view every hypothetical judgment presupposes some underlying system on which it rests. And this system must at least in part be actual. We are not restricted in judging to a system which is completely actual, but if a supposition we are asked to entertain is such that "we are not aware of any reality which furnishes a system such that the supposed case is capable of entering into it," then we refuse to entertain the supposition, because we have no ground or basis upon which to stand in judging as to the consequences of the supposition. "We may, of course, freely imagine *a* system, as complex as we please; but if we proceed to *judge* about the consequences or results of such a system, it must thus be related to these consequences within some further system; and this further system must be actual."[1] The fundamental point here is, that no system which is merely supposed, however complex it may be, is sufficient of itself to enable us to deduce its consequences. Only an actual system, it would seem, can possess this characteristic. And if we cut ourselves off from reality, judgment proper goes. "When supposition begins to infect the nature of reality, we are beginning to suppose and not to judge our sequence." The meaning is plain: that a non-actual system furnishes no ground whatever, provides us with no consequences which follow necessarily from it. Hence when we suppose ourselves to be drawing conclusions, we are merely adding further arbitrary details to our complex of supposals. To put it otherwise, a set of supposals which are not capable of falling within some real system, is not a genuine system, or totality at all, has no principle of unity or necessary connexion within itself.

This result is based on the principle that fact on the one hand and connexion of content on the other are inseparable aspects of every judgment, and that hence you cannot fabricate a pure connexion of content, without regard to fact, in order to see what consequence will follow. While the ulti-

[1] I., 272.

mate character of reality which is the ground of a hypothetical must be admitted to be unknown, still there must always be some actual system (*i.e.*, known to be fact) within which a supposition must be capable of falling. "*What must exist* is a system that, subject to the supposition, necessitates the consequence drawn from the supposition. *Whether the content itself exists or not* depends on whether it is an element essential to the system; and *how it exists*, on the nature and self-completeness of the system."[1] And if no such system exists, the supposition is illegitimate.

Bosanquet, however, seems here to be laying down a condition which would render strictly impossible all supposal whose antecedent turns out not to exist in fact. Thought can determine any actual system, if it determines it completely, only in one way; and, if you were to take such a system in its completeness, it would reject your supposition. If then it is desired to retain as legitimate any supposition which is known not to be given fact, it will become necessary to keep out of consideration all elements of reality which would interfere with the supposition. We do this, as Bosanquet remarks, in Mathematics; but we *must* do it in all genuine supposition. Even when the supposal turns out to be fact, it must not be known to be fact, and thus the system on which our procedure is based is something less than that actual real system.

We are, therefore, not resting entirely on an actual system. When Bosanquet says that the hypothetical judgment presupposes an existing system qualified by the supposition contained in the antecedent, he ought to mean, that the hypothetical judgment involves a relatively complete whole resting upon properties of reality which function in the presupposed whole, *precisely in the same way* as they function in the actual real system from which they have been abstracted.

The account of how these properties function in relation to the new whole to which they were transferred would then follow the lines of the excellent account of the way in which universals operate in thought.[2] "The existing connexions or universals with which the mind is stored, act as clues among the experiences which confront us, selecting those that are kindred or complementary, and inventing new systematic ideas after the manner of what have been called proportional systems, and by means of relative suggestion. That is to say, that an existing connexion of thought, when confronted with new matter, is able to reproduce itself in a new form" which is (*a*) "appropriate to the new matter," and

[1] I., 273. Italics mine. [2] II., 179 ff.

(*b*) "continuous with the connexion as previously thought". Continuous, because the connexion between the new objects must have "a real kinship with the connexion between the old," and appropriate to the new matter because "differentiated by the nature of the new objects themselves".

This account would show how we can make a genuine judgment based on a supposal which, though not actual, is yet capable of entering into a whole which in its entirety is not real, but whose connexions or universals are known to operate in some real system in a manner continuous with, though differentiated from, the manner in which they operate in the supposed whole.

But at the same time it would seriously endanger the proposition that reality, in Bosanquet's logical sense of the word, is the ultimate subject of judgment. For the justification of the hypothetical judgment, arrived at in this way, would lie only partly in the nature of the universals as exhibited in the real system from which they were taken; and its final justification would depend on the way in which they were modified by the nature of the new whole created by the supposal. And hence, not reality, but some aspect of reality as modified by the supposition, would be the ultimate basis of such a judgment. And the judgment would be just as true, since depending on the same principles, as any judgment whose subject was wholly real.

But Bosanquet would not admit this. For on his premises, if the judgment is to be genuine, the new matter must be real. In so far as the whole which is created is unreal, you are in the difficult position of having to do all your judging on the basis of the nature of universals or connexions as they are exhibited in the real system from which they were taken; you have nothing to stand on in determining how these universals or connexions are modified in their application to new matter. "The content of [such] judgments has an *indeterminate* place in reality so far as it has a meaning or objective reference, and depends on *determinate* reality so far as it proceeds to determine actual consequences."[1] As we are told elsewhere,[2] a hypothetical judgment whose antecedent does not really exist depends for the affirmation of its consequence on the affirmation of some reality, limited by the reservation that not the whole reality is to be taken. The element of supposed reality is the element of reservation, and that of real reality, of affirmation. And a pure supposal would be all reservation and no affirmation; and would have no grounds at all.

[1] II., 190-191. [2] II., 11.

Here, I think, is a confusion. Bosanquet considers that all supposal starts with an actual basis in reality, and proceeds by modification and reservation.[1] His examples show this. "If I suppose that over a certain spot of ground gravity ceases to operate, I can form some kind of conception of the consequence. I affirm the present state of things with reservation for the modification introduced by the limited absence of gravity. But if I suppose that there is to be no gravity at all in the world, the reservation gets the upper hand, and nothing, I presume, is left for me to affirm."[2] Again, in his treatment of negation, he shows that significant negation must have positive consequences. And his example is similar. Cut off all cohesion from the world, and nothing positive results. But cut off cohesion from a connecting rod, and detailed results follow. We fully admit this, as regards both instances. Positive grounds are necessary before any consequences can follow. But this is confused with, Real grounds (*i.e.*, grounds with a basis in actuality) are necessary before any consequences can follow. This seems clear from a passage we have already quoted from.[3] "You choose to treat as real in one sense what you do not affirm to be really real, and you record the groove of necessity which manifests itself when the artificial reality is considered as though forming part of the real reality. Of the differences within the universal which determine the remaining differences (in this case the consequent), part (the hypothetical ground) are only sham reality, and, therefore, although we seem to exert inferential activity, we cannot affirm the conclusion of the inference." True, we cannot affirm the conclusion of the inference, *of actual reality;* but the inferential activity was real, and not seeming. Yet Bosanquet goes on in this passage to argue as if the inference was not a genuine inference,

[1] If we were compelled to test the legitimacy of the fundamental propositions of geometry by an act of this kind, geometry, I feel, would never have discovered "the sure path of science". There, as we have already seen, universals operative in our actual experience are abstracted from the matter in which they are embodied, and "continued imaginatively in new matter". The new matter, as we have seen, makes a difference; and although it too has been derived from actual reality, still in its new connexion it results in a non-real whole. A genuine supposal, if completely expressed, must stand the test of self-containedness. What we have to do in Geometry is to state *all* we are supposing in such a way as to make explicit precisely what elements we have combined into the whole with which we are dealing; and that whole is sufficient as a basis for our judgments. The question is not, how a particular supposition would modify the actual structure of reality, but, what are the characteristics we are including in our total supposition.

[2] II., 11-12. [3] II., 11.

if the grounds were not real; helping himself out by showing that the inference is not genuine if the grounds are not positive.

The same thing appears in the parallel discussion at a later point.[1] The real ground of the consequences of a supposal, he there says, is determinate reality: the content of the whole judgment (dealing with a supposed subject) has indeterminate place in reality. Yet he goes on to say, that while the ground must be real, the factuality of the ground makes no difference to the apodeictic force of the judgment. "The basis of the synthetic transition is here as everywhere the nature of an identity or universal, and that the universal is affirmed to be fact makes no difference to its apodeictic force. What . . . that apodeictic force may be, how it should come to pass that one thing should necessitate another, depends . . . on the ultimate fact of the nature of knowledge."

But if the view indicated in this quotation is correct, what hinders us from predicating the judgment, not of reality as resulting from the actuality with which we are in contact in presentation, but of the subject of which we have actually made the judgment? Grounds need not then be realities (in Bosanquet's restricted sense), but they must be positive contents.

Bosanquet's contentions are supported by a discussion of certain supposals which, I cannot help thinking, are not the only types which could be taken. "If two were four, then three would be six." "Given a first cause, we can dispense with the idea of a regress to infinity." "If a man were throughout the whole period of his conscious life alone in the universe, his moral purpose could be nothing but to please himself."[2] "If a being were confined to space of two dimensions . . ." *In all these cases we are not supposing enough.* We are helping out our supposal by reference to the general characteristics of some aspect of reality. And our supposal renders it impossible to know how far these general characteristics are to be taken as unchanged. But Mathematics supplies many instances of complete systems being supposed, which do not depend for their completeness on anything not explicitly specified. The non-Euclidean Geometries are cases in point just as much as the Euclidean. We have other instances in certain games—which create a world within which human beings are to act, and specify explicitly the conditions under which the actions are to take place. Judgments with reference to certain moves (*e.g.*,

[1] II., 190-192. [2] I., 273.

that a move made by one player opens up certain possibilities for his opponent) are not to be set aside as judgments only in a secondary sense. For they bear all the characteristics of judgment save one—their ultimate subject is not reality. But we have seen reasons for rejecting this characteristic as not being essential. We should therefore conclude, that every judgment is relative to some system, whether real or supposed, which is sufficiently complete to render the judgment necessary; for we hold that it is possible to construct various systems of this kind without finding it necessary to draw on any unspecified portions of reality. If we specify the precise portions of reality on which we are drawing, then not reality, but the system we have specified, is the ultimate subject of our judgment.

We may take as an elementary instance the game of Noughts and Crosses. The game starts with a square divided into nine squares, which have to be filled in by two opponents playing alternately. The first player (A) puts a O while the second player (B) puts a X. That player wins who first succeeds in filling in three squares in a line. The game is in all its essential characters parallel to chess; but for our purposes it is much more suitable than chess, owing to its greater simplicity, and owing to the fact that generalisations are much easier. For instance, if A puts his first O in any corner square, he can win unless B puts his first X in the centre square. Now what we have to note is that the conditions of the game provide a system of order, whose positing posits also a definite set of alternatives, resulting in so many games, and at the same time decides precisely what consequences these alternatives will have. After A and B have played a certain number of moves, an analysis of the remaining alternatives gives a necessary answer to the question as to whether A can win, or only draw. We are working of course in the original form of the game with the nature of space, and it may be said that it is the nature of space which is under consideration. But the spatial form of the game is not essential. We could start with any nine elements, represented, *e.g.*, by the letters A, B, C, a, b, c, α, β, γ, or by any other signs, and allow the opponents to choose one alternately, that player winning who succeeded in obtaining any one of a specified set of sequences (*e.g.*, Aaα, ABC, etc.). Nor does time enter. It may be said that A and B have to choose alternately in time; but the completed alternatives, which are the ground of decision, do not involve time, and refer only to order. We have here, it seems, a pure non-spatial, non-temporal system of order, which is constructed at will, from

very simple premises, affording a large number of possibilities, and deciding as to the nature of these possibilities. And it seems as if the investigation of these possibilities is just as much a science (very elementary indeed, but a science nevertheless) as any other science. Chess shows the same character in an infinitely more complex form. Judgments within the science are objective, universal, and necessary. They explicate the nature of a self-subsistent totality. Thus they are not mere tautologies, nor mere statements of conjunctions; for the principles involved in stating the system are true *developing* or *generating* principles. And in judging as to the results which follow from the system we are wholly within the system, and not resting on Bosanquet's reality at all. The nature of the system involved in such a game is in all essentials identical with that of the system which is the subject-matter of Arithmetic, or of Geometry; and this nature appears more clearly from a consideration of a game, where there is no question of the application of the results to existence, than in the case of Arithmetic or Geometry, where this application is possible.

It is often said that the mind gets the elements of these wholes from what actually exists. This is in a sense true. But it does not prevent the new wholes from being independent of actuality. Universals met with in actual existence are "continued imaginatively in new matter"; this new matter is derived from actual existence; but the guarantee for the use of the universals in the new matter is the new whole itself. I do not see how we can avoid accepting what Meinong calls "das Prinzip der Unabhängigkeit des Soseins vom Sein,"[1] and thus Daseinsfreiheit, as a characteristic of certain objects of thought. Meinong argues, that while it is true that every Gegenstand is connected with existence in space and time in regard to what he calls "das Vorbestimmtsein von Gegenständen durch ein Wirkliches," yet "Der so Vorbestimmte Gegenständ existiert darum keineswegs, und auch von seiner Nicht-existenz wird in dem betreffenden Urteil durchaus nicht gehandelt; das Urteil ist eben daseinsfrei". I should insist strongly on the necessity of some system of a determinate type as the basis of judgments. But in judging with reference to any such system, I should agree that we do not need to refer to the question of its relation to what actually exists in space and time.[2]

[1] Meinong, *Über die Stellung d. Gegenstandstheorie*, etc., p. 38.

[2] In denying that all objects of thought must be ultimately real, I have used the word "real" in Bosanquet's sense. Whether such objects of thought are real in a wider sense, is considered below.

D.

We may proceed to a further determination of the nature of an object capable of being thought about. My purpose is to ask what can be said in general of objects which are capable (1) of setting thought to work investigating their further characteristics, and (2) of guiding thought in this investigation. By "thinking about an object" I shall here mean only "investigating the characteristics of".

I shall start from the standpoint indicated by Stout, in his papers on "The Object of Thought and Real Being,"[1] and on "The Nature of Judgment,"[2] though his object in these papers is different from mine. If truth and error are both to be possible as the result of thinking about an object, he points out, there must be an object present to thought (or before thought) whose characteristics as already known are not such that the object is known in its complete detail. That is to say, the object must be thought of as having certain characteristics which are not present to thought. But again, these further characteristics must be thought of as related to those already known, in the way in which alternative specifications of a generality are related to the generality. "I [must be] aware that an actual content having some specific nature is there, and that it is one of a group of possible alternatives."[3] So in the first paper, "Some real being as such is directly an object of consciousness; this real being is capable of alternative determinations".[4] So far as Stout's problems are concerned, this is enough. For he is asking a more general question than ours, namely as to the conditions enabling us to judge (so as to judge either truly or falsely) about any object, whether in judging about this object we have to go beyond the object itself, making actual experiments (as in the case where I hear a noise, and go out of my room to investigate), or whether we merely rest on the information already provided for us by the object itself (if that is possible). My problem concerns the latter of these two alternatives. I am asking if it is possible for an object of thought to be capable of providing (*a*) not sufficient information to tell us immediately all about itself, but (*b*) the sufficient ground for further determination of its characteristics.

If then there can be such an object, its characteristics must be such that (*a*) the object is known as having certain general characters, capable of alternative determinations, one or other of which it actually possesses; (*b*) its characters are

[1] *Arist. Soc. Proc.*, 1910-11. [2] *Ibid.*, 1914-15.
[3] *Ibid.*, 1914-15, p. 338. [4] *Ibid.*, 1910-11, p. 190.

sufficient to indicate to thought which of these alternative determinations it does possess.

Can we add (*c*) that these general characteristics must be sufficient to determine uniquely what further characteristics the object must possess? I do not think so. Provided by thinking we are able to reduce the number of possible alternatives, even though we cannot reduce them to one, we can say that the object has been capable of being thought about. If, for instance, in a problem in Arithmetic, we are told that a certain number possesses certain characteristics, we may begin by knowing that it is one of the infinite set of even numbers, and end by knowing that it is either 10 or 14 or 16. Such an object is not uniquely determined at the end, but it is more definite at the end than it was at the beginning; and this is enough for my purposes here. To take a case. If we are given that there are two positive whole numbers whose sum is 6, one being greater than the other, then, so far, there are various alternatives, for the further determination of which thought is needed. According to the first condition, one of the numbers might be anything from 1 to 5. But according to the second condition combined with the first, it is limited to either 1 or 2 on the one hand, or to 5 or 4 on the other. The combination of the two conditions then is the result of thinking, and leaves us with fewer alternatives than either of the conditions separately. If further we are told that the greater of the two numbers is an even number, we are able to determine both of the numbers uniquely; but this fact has not in any way altered the general nature of the object, so far as thought is concerned.[1]

Let us consider a general type suggested by the above problem. Suppose an object X is characterised by the general qualities A, B and C, each of which is capable, taken by itself, of a large number of alternative specifications. It is clear that X can be further determined by thought, if the result of considering X as being A and B and C enables us to

[1] If it be asked how A can have the predicate "*a* or *b*," the reply must be that this has been shown to be an improper question. If the judgment "A is *a* or *b*" is a legitimate inference from the system on which the judgment is based, then the judgment is true. It is true of A. But it is the whole judgment which is true of A, and this judgment does not contain a predicate which is a quality of A. Thought is thus rather a matter of inference than of judgment, if by judgment is meant characterising by applying predicates. The difficulties of the notion of substance-attribute, which have given so much trouble to the Logic of Bradley and Bosanquet, are due to the questionable resolution of the judgment S is P into a qualification of reality. They can only be avoided, I think, by the resolute acceptance of the view that, when we say "S is P," we are asserting *not* "*P*," but "S is P" of S. *Cf.* Latta, MIND, 89, p. 107.

reduce the total number of alternatives. One condition of this is, that A's, B's and C's alternatives should be all selected from some single field of alternatives. And again, A's alternatives must include only some, and exclude all the rest of these alternatives, and so for B's and C's. *E.g.*, suppose there are certain characters *a*, *b*, *c* . . . *z*, of which A is compatible with *a*, *c*, *e*, etc., and incompatible with the rest, while B is compatible with *b*, *c*, *d*, *f*, . . . and incompatible with the rest, and so for C, then we may be able to reduce the number of alternative possibilities as the result of thought. The object which contains A, B and C may be impossible, or it may be uniquely determined as *k*, or it may be determined as "*l* or *m* or *n*". In each of these cases it would have been an object capable of being thought about. It would only be incapable of providing further determination for thought if all and only the alternatives possible for A were possible for B and C. But thought might be necessary in order to see this.

For instance, if I am building a house, and am endeavouring to determine the position, size, and materials, supposing that my house has to fulfil certain conditions any one of which is relative to a number of alternative positions, sizes, etc., within certain limits (not necessarily a finite number), then by taking these conditions together I may be able to reduce these alternatives to a very restricted set. The conditions may render any house impossible, or may determine various possible houses, or only one. Here the house falls within actual reality, and the determination of the various alternatives falling under any one of the general conditions will depend on premises derived largely from actual data. But the same broad general description applies as to any theoretical problem of the above-mentioned type.

If, on the other hand, some of the conditions related to size only, some to position only, some to materials only, and if size, position, and materials could not be connected in any way, then thought could not get to work. This is a general condition in relation to problems of this type: that all the alternatives rendered possible must belong to one specific field. We need not here determine this condition any more broadly by saying that they must be all capable of falling under some generality G, of which they are alternatives belonging to the same *fundamentum divisionis* of G. *E.g.*, when I am investigating an object in the distance, and can say, that with the colour it has, it must be either a cow, or a horse, or a dress, etc., and being in the place it is, must be either, etc., the conditions here might render it easy to decide what the object was, but it would be no help to find the

generality G, with *fundamentum divisionis* F, which would result in the alternatives cow, horse, dress, etc.[1] It is sufficient that as a result of combining the alternatives allowed by the various conditions, we should have a smaller number of alternatives than by taking any one characteristic alone.

We have not yet, of course, proceeded very far, but far enough, I think, to specify the questions which must be answered before we can determine whether an object of thought which satisfies the above conditions can provide a sufficient ground for thought. The main question which will be asked is, What is the nature of a characteristic, say A, if it is to be such as to give rise to the judgment "A is either *a* or *b* or *c*"; or, using the word "generality," as Stout does, to describe a characteristic which is capable of further specification in alternative ways, What is the nature of a generality? And arising out of this, Of what type is the judgment, "A is either *a* or *b* or *c*," and on what grounds is it based? Is it self-evident? Or, to put it differently, Of what type is the judgment which determines that a generality is capable of certain alternative specifications? I shall consider these two questions together, and shall suggest only tentative answers.

In the first place, generalities are suggested by definite wholes met with in perceptual experience. And the basis of all our thinking in connexion with generalities, is to be found in the insight we have reached into the relation of the generality to its specifications in actual experience. Not that this insight can be given in actual experience, for it is by means of this very insight that we are able to understand our experience—even, it might be said, to discriminate certain differences as *the* differences between two wholes. You do not start by distinguishing yellow from red and blue, without any idea of the generality colour, and then go on in some way to discover that all these have something in which they agree. When an object is distinguished as red from another as blue, there is already an awareness of the generality colour. Our question then, is not that of how generalities are derived from particulars, for they are not so derived; nor even of how generalities are seen in relation to concrete wholes; our question is rather, admitting the presence of generalities in all our interpretation of experience, in what way the alternatives considered as falling under a given generality are related

[1] Though it is probable that in a purely theoretical case of this type such a condition would hold, *e.g.*, in the solution of geometrical problems by the method of intersection of loci, all the conditions determine points; in solutions by equations, the conditions determine numbers.

to the generality itself. And I should answer, that while the understanding of particular wholes in actual experience furnishes the clue to the nature of a generality and of the various alternatives of which the generality is capable, yet insight into the nature of the generality itself is the necessary foundation of the judgment that the generality is capable of such and such alternatives; and it is by no means necessary that all the alternatives should have been actually met with in experience. Starting with definite examples of a generality as a clue we may be able to see that the generality admits of a continuous set of alternative specifications, and so on. It is commonplace that most inventions depend on the perception of a possible alternative nowhere actually met with.

So much, I think, will be admitted by many who would insist that, in gaining insight into the nature of a generality and its alternatives, even though some of its alternatives may never have existed, we are not by any means enabled to cut ourselves free of reality in Bosanquet's limited sense. I have already tried to deal with this, and to give reasons why I am forced to think that our alternatives follow from the *nature* of the generality and not from its *reality*: the question of its reality being irrelevant to the ground of our thinking.

I do not think that this position is invalidated by the fact that in reasoning on a generality we may not have before the mind the whole nature of the generality, and that in order to realise its further nature we may have to go to actual experience. As Ward says,[1] in thinking of a generality, there is present to our thought only so much of the nature of the generality as is relevant to the problem or judgment under consideration. *E.g.*, in understanding the proposition "A stands in the relation R to B," we may not have to consider whether R is transitive, one-one, or symmetrical, etc. In considering whether from ARB we are entitled to infer BRA, we have not to consider whether R is transitive, or one-one, etc., but only whether it is symmetrical. As new needs arise, new characteristics of R may have to be thought of. And to enable us to think of these, it may be necessary to go back to the whole perceptual experiences from which R was torn (as James suggests).[2] But in all this we are resting ultimately on insight into the nature of R. The objection that this is to make simple intuition the basis of thinking, and that this is the rock to avoid,[3] I should meet

[1] "Psychology," *Ency. Brit.*, vol. xxii., p. 591 (11th edition).
[2] *Psychology*, vol. i., p. 465. [3] *Cf.* Bosanquet, *Logic*, ii., 236.

by a simple denial. What we are resting on is insight into the nature of a system; only we are insisting that there are systems sufficient to rest this insight on, less than the whole of reality, and not falling entirely within the reality which results from the understanding of what is actual.

One result naturally leads out of this. Bosanquet insists that no whole short of the whole of reality can be a true individual, and hence no whole short of the whole of reality can be sufficient ground for a true judgment. In his defence of his position against criticism, he uses three criteria of individuality.[1] An individual must be self-contained, self-complete, and unique in the sense that it contains in itself the reason why there need not and cannot be another just the same. Now these, I would insist, may be the criteria of a real individual in Bosanquet's sense of reality, but I do not think they are criteria of a logical individual. To take the last condition first, a whole which is capable of being thought about need not be unique in the sense of being completely determined in all specific detail. It need not be thought of as so determined. An object X which sets thought a problem and guides thought to the result "X is either *a* or *b* or *c*," is a satisfactory object, so far as the truth of the judgment "X is either *a* or *b* or *c*" is concerned. It may not always satisfy our practical needs, but that is not the point. It follows that the second criterion, of self-completeness, does not apply, except relatively. The first criterion, of self-containedness, holds in the sense in which a generality with its alternative specifications is self-contained—in the sense namely, that it is the nature of such a generality on which we rest in the last resort, in understanding how its alternative specifications are possible for it; not in the sense, that we never need go to actual experience beyond such a generality in order to put ourselves in a position to get this understanding. We must distinguish between the process of gradually attaining insight, and the grounds on which this insight ultimately rests.[2]

[1] Bosanquet, *Logic*, ii., ch. viii.

[2] According to Stout, *Arist. Soc. Proc.*, 1902-1903, the ultimate subject of judgment must be concrete, in two senses. It must be self-existent as compared with its partial aspects. And again, it must not be a partial feature of anything else. "Concreteness is underived particularity." I defer consideration of this for another occasion; but it will be seen that I should differ from him as to the second condition. On my view a true logical individual can be a partial feature of other things. This is bound up with the view expressed above regarding universals (page 439). On Stout's view the question arises as to whether possibilities, with their alternative determinations, can be ultimate subjects of judgment. If so,

Is a logical whole necessarily teleological? If what we have already said is correct, the answer to this question follows. A logical whole must of course be sufficient to enable us to understand its nature, and the way in which its constituents are related to it, but it need not be, nor be conceived as, purposive. It must be purposive, according to Bosanquet, because otherwise our purposiveness in judging about it—even in selecting it for judging about—will be external to its nature. This consideration appears irrelevant. Our purpose in selecting it for consideration may be what you will: this does not affect the truth of the judgments we may make about it. The judgments we make about it, which are guided by the general purpose of understanding its nature, may be determined by special interests; that again is irrelevant to their truth or falsity. Our purpose, I should contend, may enter, but it is irrelevant to truth. I am aware that this is within a large field of controversy. But in relation to this controversy I should take up the general position that purposive judgments all rest on non-purposive judgments. Again, I should insist that if purposive judgments (in the limited sense of judgments made in the interest of practical activity) are to be genuinely possible, there must be systems which can genuinely give rise to non-purposive judgments of the type "S may be either p or q or r," without determining which of these alternatives is to be the actual one. Purposive action seems to be essentially action for the sake of determining such a system as, say, p rather than q or r. But it would not be possible to discuss this question here.

they must, it would seem, be concrete in Stout's sense. And this they do not seem to be. Yet he appears to agree that generalities can be legitimate grounds of judgments regarding their alternative possibilities. (*E.g.*, MIND, 1908, p. 22.) Another difficulty I have is this: If such possibilities *are* ultimate subjects of judgment, they must, on his view, be individualised by reference to our immediate psychic state. When I think of a possibility and its alternative determinations, there must be in my mind some presentation (sensory, imaginal, or non-imaginal) which directs my thought uniquely to this object. If the presentation were different, the object thought of would be different. (MIND, Jan., 1911, etc.) But he seems to admit (*Arist. Soc. Proc.*, 1902-1903, p. 9) that with the same sensory and imaginal elements we could mean a different object in two cases. The difference of presentation here would be non-imaginal. Non-imaginal presentations would be the rule, rather than the exception, in relation to generalities. But I cannot help feeling that it would be preferable to say with Husserl (*Log. Untersuch.*, ii., p. 109, 130) that we must regard the act of meaning as a specific act which is based on, but not wholly determined in direction by, presentational elements. But the whole question demands a full discussion.

E.

We have spoken of a type of object of thought which is not real in Bosanquet's sense of the word; and our problem now is, to determine whether or in what sense we can speak of objects of thought of this type as real.

It must first be noted that in certain points, thought has precisely the same relation to such an object of thought as it has to what is actual. In the first place, it is set over against thought, as something which has determinations, which thought has to discover. It constrains thought. In other words, it is objective in the sense that its properties are related to it in a way which excludes any arbitrary dealings with it on the part of thought. This is sometimes interpreted as meaning that its being cannot consist in its being thought by particular thinkers. The precise sense in which this is so, we shall have to discuss later. In the second place, it is not exclusive to any individual thinker. It is an identical reference, something to which all thinkers can refer. It may be held, in the third place, that the question as to whether and in what sense it is independent of thought altogether has exactly the same significance, and is discussed by the same arguments as the parallel question in regard to existence in space and time. But this is perhaps not the case. For there may turn out to be two senses of the word independence, in both of which senses actual existence is independent of thought, while non-existent objects of thought have only the one kind of independence. Non-existent objects might be independent of thought only in the sense of constraint and identical reference, while actual existents might be independent in a further sense. It is then perhaps better to consider only the first two points.

Thus we can conclude that, whether real or not in the sense in which actual existence is real, the object of thought of the type under discussion has in certain important respects precisely the same relations to thought as actual existence has. Does the fact that the object of thought has these relations to thought entitle us to say that the object of thought has being or reality in some sense apart from thought? The real has just these relations: they are an important part of what we mean by reality. But if it turns out that there are many differences between what actually exists and such objects of thought, are their points of identity of sufficient importance to warrant us in classing them both under the head "being," with the explicit connotation of constraint, identical reference, and (possibly) independence, and in going

on to think of this being as ontological? What are we to mean by "ontological being" here? Are we to think of it as identical with the being at which we arrive when we think of existence, abstracting from its time and space character? What is actual exists in space and time: we can represent to ourselves that it has a character which is separable in thought from the nature of space and time. And we can call this quality by the name being, by which we do not mean merely its "subsistence" as an object of thought for some thinker. We may, perhaps, help ourselves by the analogy of a thin, tenuous substance, what exists in space and time being thicker, muddier, perhaps. And after having passed beyond this materialistic way of looking at substance, we may come to realise the notion of substance not merely as a logical function, but as ontological. Having arrived at the conception of "being" in this way—being as ontological substance—can we go on to identify it with the conception of "being" arrived at from a consideration of the relation of thought to its objects (being as a logical function)? This is a course which presents difficulties.

My main difficulty is that I do not think it will help us to understand the relation of thought to its objects. Being as a logical function is all we can use here; and to think of this being as also an ontological substance adds nothing in this connexion. This may be brought out by a consideration of certain points in Stout's view. On his view, generalities are real *per se;* and this involves the reality, in the same sense in which actual existence is real, of all the possible alternative determinations of these generalities. And on the other hand, generalities are inconceivable except in relation to particular existence; thus we can speak of the one system of universal reality, which includes particular existence, and hence generalities, and hence all the possible alternative determinations of these generalities.

A question arises in connexion with this view. If truth and error are to be possible in relation to an object of thought, we have seen that on Stout's view, which we accepted, the object must be present to thought as a generality capable of having alternative possible determinations, and must also be thought of as actually having some one or other of these determinations.[1] For our belief to be true or false, we must believe

[1] On the view expressed in this paper, of course, an alternative "*a* or *b*" would be considered as being as much an actual determination of an object as a definite "*a*". The object of thought, that is, need not be uniquely determined. Stout would not agree with this.

that "an alternative possibility is the fulfilled one".[1] How shall we interpret this phrase? Stout's indications are not perfectly unambiguous. He speaks of an alternative as agreeing or disagreeing with "the reality to which the mind itself refers as its standard in the act of believing, as what requires to be specified in some determinate way".[2] This reality is thought of "as being determined in a certain way among other possible ways, but the determinate reality itself is not apprehended in its determinations".[3] Again, this reference "is in general not merely to the real universe as a whole, but to some special portion or aspect of it, which, if it is not determined in the way we believe, must be determined in some alternative way".[4] And if we add to these passages the passage in which the various modes of being are spoken of as being all "inconceivable except in correlation with each other," as having "being within the one system of universal reality," "as being an integral part or aspect of this reality,"[5] then it would seem that what thought is endeavouring to understand is some special portion or aspect of the one system of universal reality, with whose definition thought has nothing to do. But this I think would be a mistake if it meant that thought *has had* nothing to do with the determination of the special aspect of reality under consideration. The result needs to be given careful interpretation if the position is to be made clear.

What is the difference between a possible alternative and a fulfilled alternative? For all alternative possibilities *are*. They are real. They "fall within" reality. This however does not mean that they are alternative possibilities of reality as a whole. They *are* only as predicable of the generality of which they are alternative possibilities.[6]

What then are we to say of a fulfilled alternative? A fulfilled alternative on its side is relative not to reality as a whole, but to some aspect of reality. Thus "this is an alternative possibility in relation to the generality G" may be true. But "this is *the* alternative possibility—the fulfilled alternative—of the generality G in relation to the determinate system S" may be false. If then our object of thought is the system S, then, in relation to this system regarded merely as containing the generality G, various alternatives are possible: but in relation to the system S taken in its determinateness, only one alternative is possible. Now

[1] *Arist. Soc. Proc.*, 1910-11, p. 195.
[2] *Ibid.*, p. 196.
[3] *Ibid*, p. 195.
[4] *Ibid.*, p. 190.
[5] *Ibid.*, p. 194.
[6] *Ibid.*, p. 193.

the important point is, that *the onus of determining the system S falls upon thought, and not upon reality.*[1]

I feel that Stout would agree to this, in view of his belief that within reality there are *all* possible modes of being, and that thought is relative to some aspect of reality. For thought must determine what aspect it is relative to in any given case. To speak, then, of an alternative as the fulfilled alternative, is to speak with reference to an object which thought itself has already determined in its completeness, although the principles by which thought has already determined this object may not be such as explicitly to determine it in all its details without a further development by thought.

Thus the objects which thought thinks about cannot be identified by appeal to the fact that they are real; but must be identified by being determined (over again if you will) by thought. And so far as I can see it cannot be because they are real that they exert compulsion, but because thought has determined them as so and so. In other words, even if the objects of thought are real apart from thought, still thought can only know which object it is dealing with by recreating it. But if this is so, then the compulsion and identical reference which are characteristic of the object of thought (being as a logical function) are not in any way explained by considering their being as ontological, as well as logical.

At this point two alternatives seem open to us. We may go resolutely forward, and take the characteristics of an object of thought of the type under consideration as the fundamental meaning of the word "real," and then review the various orders of reality in the light of this; connecting existence with being, rather than being with existence. This is the way of the new realists.

Or, on the other hand, we may decide that some objects of thought have being only for thought, and then the problem is to interpret this. We should have to find some meaning for the phrase "being for thought" different from the meaning given to it by Stout.[2] An object of thought could not be a "mental content" in the sense of the representationists. It would have to be regarded in some way as a meant object, the result of thought meaning this rather than that (in the active sense). But the problem here, with which I do not see my way to deal, would turn on the function performed by thought.

[1] Even if alternative possibilities, such as G, are definitely involved in actual existence, still it is by no means clear that this is the case of the various systems S, about which we can judge. It is with systems such as S that we are now dealing, and this introduces a further difficulty.

[2] MIND, 1908, pp. 20-21.

But the difficulties raised by adopting the second alternative do not seem to be resolved by the adoption of the first. The realist has to explain the relation of object to thought as ultimate. The object is revealed to thought. Now this phrase is less intelligible in relation to an object of thought of the type under discussion than it is in relation to an object given in sense perception. For in the latter case thought is directed to the object by processes and characteristics which, *prima facie* at least, fall outside of thought itself. But in the former case, this is not so. Thought directs itself to the object it is to consider, by determining it in some respects; and it is forced to determine the object in a number of respects sufficient to guide it in the further determination of the object. But if this initial determination of the object falls wholly on thought, and if these initial determinations are to be the sole ground for thought's further dealings with the object, where is the place for the decision that the object falls beyond thought, so as to be real independently of thought, and to reveal itself to thought?

The difficulty we are considering does not arise for Bosanquet, since on his view the objects of thought we have been dealing with are not genuine objects of thought. But I find myself unable either to deny their genuineness or to solve the problem to which the admission of their genuineness gives rise.

There is, however, another set of considerations, by which we might be led to conclude that any object of thought is real in precisely the same sense as actual existence is real. The objects of thought we are considering consist, it will be remembered, of systems of generalities and their alternative determinations. All the generalities of which human thinkers can be aware have been derived from a consideration of actual existence; although not all their possible alternatives need have been there met with. It seems obvious that the particular alternative determinations of these generalities which actually exist, are real. Thereupon two questions arise. Does this apparently obvious fact necessitate, in the first place, that the generalities are real in precisely the same sense in which their actual alternative determinations are real? The answer to this question depends on whether we regard what actually exists as truly described, when it is described as the alternative determination of some generality: which would be answered in very different ways by modern philosophers. Stout's argument involves an affirmative answer. Some philosophers would insist that all generalities are conceptual fictions; others would hold that only some generali-

ties are genuine concepts, most classes or kinds having only practical and not truth-value, being only pseudo-concepts. But supposing the question be answered in the affirmative, then a second question arises. Generalities are real, in the same sense as actual existence; but are *all* their possible alternatives real in this sense, or only such alternatives as are actual? And this question makes us go back to our previous question, and introduce a distinction. When we decided that generalities were real, as actual existence is, did we mean, generalities *per se*, or only generalities considered in relation to actual existence? Granting with Stout that generalities must be real if particular existence is to be thought, we must still decide this further point. For while generalities, considered *per se*, are capable of being thought as having other determinations than those which actually exist, yet, if generalities are considered as essentially in relation to particular existences, they must be recognised as really having only those determinations which actually exist. And it may be asked whether this last is a possible contention. Would the consequence follow, which has been so often drawn, that kinds are thus not real at all, even in relation to particular existence, but only creations or fictions of thought? Can we, in short, avoid the alternatives, either generalities are not real at all, or they are real *per se*, and hence all their alternative determinations are real? Is it possible to hold on the contrary that generalities if considered only as having such alternative determinations as exist, are real, but that, if generalities are considered as having all the alternative determinations which thought can specify, then they are only fictions or creations of thought? And again, even if generalities with all their alternative determinations were regarded as real, would this involve the reality of all constructed systems composed of various generalities? I cannot at present see any way of deciding these important questions, apart from the considerations already mentioned, as to the logical functions of being. And these considerations, I have tried to show, do not help us.

Another way may be tried, of asking what characteristics actual existence can have in respect to its ontological being, which the object of thought has not. And here many answers will be given. It may be said that the ontological being of what exists consists in its activity, and in its continuance; and that thus "eternal being," *i.e.*, being apart from time and space, is inconceivable. And if this be accepted, then objects of thought which are merely ideal cannot have ontological being. On the other side it may be said

that of this activity we can have no conception; or again, if we can conceive it, it involves the notion of identities which are not themselves time and space conditioned, and are to be considered as having ontological being. But in all this we are passing to a point of view which is not distinctively logical, and which, however we may finally decide, does not directly help us with the strictly logical problem.

V.—DISCUSSIONS.

LOGIC AND FORMALISM.

Dr. Schiller, who is universally regarded as the most formidable opponent of formal logic, has (in No. 106) commented briefly on the views expressed by me, and (in No. 104) criticised at considerable length those of Mr. Pickard-Cambridge, which are, I have every reason to believe, practically identical with my own.[1] I propose to reply briefly to both contributions.

Dr. Schiller's remarks on what he calls my concessions and his opinion that my defence of logic is more damaging than his attack call for some comment and perhaps for a little further explanation. I will endeavour to make it clear that I have, from my own point of view, made no concessions whatever, and that I am entirely indifferent to whom or to what my remarks may be damaging. Personally Dr. Schiller and I have much in common, and (whether or no it is mutual I cannot say) there is on my side at least considerable sympathy. On certain matters of principle raised in this discussion, which appear to me to be philosophical rather than strictly logical, there is a fundamental and irreconcilable difference.

On the personal side I will say at once that the striking contrast between the powerful attack Dr. Schiller has made (in his book on logic) on present day logical theory and the general silence on the part of those attacked is in my opinion in every way creditable to Dr. Schiller. I, on the other hand, hold no brief for "logic as she is taught" nor for the multitudinous confusion with which modern logicians have enveloped and disguised what to me are a number of very simple and obvious principles. To that extent I am entirely satisfied that my remarks should be damaging. My concern here is solely for the principles themselves. Dr. Schiller should try to differentiate between his opponents and to deal with the case as it is put before him.

In his reply to me Dr. Schiller cannot be said to have done so and in particular he has in two glaring cases failed to appreciate the significance of the argument to which he replies. He appears to think that my antithesis between strictly formal logical reason-

[1] It must be clearly understood that I am claiming Mr. Pickard-Cambridge's agreement merely on the specific question of the use of a universal in reasoning, and, in a general way on the nature and functions of formal logic. Mr. Pickard-Cambridge is, of course, in no way committed to my special or personal views or claims, or to every argument or statement contained in this paper.

ing and the rough and ready medley of practical life, partly empirical and instinctive, and partly reasoning good and bad, is entirely in favour of the practical product, and asks "but is it not the business of logic to set them right". In parliamentary parlance the answer is in the affirmative, nor have I at any time stated or implied the contrary. So far as in practical life we reach conclusions by invalid reasoning it is the business of logic to show that it *is* invalid. What I was endeavouring to make clear was that in practical reasoning, argument, discussion (call it what you will) there is a considerable element, empirical and instinctive, which is not capable of strict formalisation.

The practical man, doubtless, in a majority of cases "gets there," in a minority of cases he goes badly wrong. The point I was making was that it is not a true criticism of formal logic that it is unable to formalise that part of "getting there" of arriving at conclusions which is not in its essential nature formal. In this statement there is nothing damaging to formal logic, though there may be to writers on logic who fail to appreciate its limitations. I think this disposes of Dr. Schiller's "terrible misology". If he wishes to make that criticism he must at least condescend to examine the position in greater detail.

Dr. Schiller's comment on the scholastic position, and on my interpretation of it, is still more astounding. I do not pretend to be an authority on scholastic logic but the statement I put forward is most elementary and can be appreciated by an extremely casual study of the subject. That anyone writing a discussion in this journal should be so ignorant as to fail to appreciate the point put forward and should also neglect to obtain some information before disputing so simple a statement is incredible indeed. To repeat the statement: It is generally recognised among scholastic logicians that there is (*a*) a sphere of knowledge, called by them *certain* science, to which the methods of logic and deductive reasoning strictly apply, (*b*) a sphere of provisional or empirical knowledge to which the methods of formal logic are only partially applicable. It is the special standpoint of the schoolmen that knowledge (*a*) or certain knowledge is superior to knowledge (*b*) or provisional knowledge. If Dr. Schiller or anyone else contends that any branch of knowledge is of the empirical order, that contention, if established, *ipso facto* places it in the second or inferior category.[1]

[1] The following quotation from Dr. Coffey's excellent text-book of logic shows the standpoint of the schoolmen fairly clearly :—

"Fourthly and finally the scholastic method counteracts the narrowing influence exerted on the mind by a constant and exclusive contact with the facts of sense, it nourishes in the soul what we may call the craving for the universal, the desire to grasp the idea in the fact, the abiding law in the contingent phenomenon. . . . Again the importance attached by scholasticism to *certain* science inclines its disciple to depreciate the value of the merely probable and provisional. To the scholastic mind the slowness of experimental work is irksome, it easily becomes impatient of the problematic character of most historical, sociological and economic

Nor can I understand how anyone can fail to appreciate a certain plausibility in the position. Let us take a very simple illustration. The truth that two and two make four can be placed in the first category. The truth that two raindrops plus two raindrops may in some circumstances make one raindrop undoubtedly comes in the second. Cannot Dr. Schiller see that there is a very powerful case for the metaphysical position that the first truth, a fundamental property of number, belonging to a sphere to which formal reasoning is strictly applicable, is superior to an empirical truth dependent upon the surface tension of liquids. I do not wish to be understood to be arguing for or against the scholastic position. But at least it will be generally agreed that there is no sufficient reason for denying validity and importance to strictly logical reasoning in the admission that there is a considerable sphere of practical life (or material truth) to which it can only be applied with caution and reserve. It would be as sensible to abolish elementary arithmetic because it is not invariably applicable to the properties of raindrops. As Dr. Schiller would put it the material fact that two articles plus two articles make four articles "has to come independently and empirically" and the truth that two and two make four "can at most guide expectation". What therefore according to Dr. Schiller becomes of simple arithmetic? Anyone who has been confused by Dr. Schiller's brief remarks will now begin to see that the "dualism between logic and common sense" is not altogether absurd.

A few words are now needed concerning Dr. Schiller's lengthy comment on Mr. Pickard-Cambridge. This particular discussion has puzzled both Mr. Pickard-Cambridge and myself not so much concerning the view that Dr. Schiller was trying to express but in

inductions and of the many reserves with which the materials of the special sciences must be employed" (vol. ii., pp. 20-21).

The context of the passage quoted is even more striking than the quotation itself, for Dr. Coffey is here arguing that the principle should not be pressed too far and that the inductive sciences and their methods really are worth studying, notwithstanding the absence of "certainty".

The standpoint of the same work towards the relation between formal validity and truth certainty is also interesting.

"We have now completed an examination of the *formal* aspect of the reasoning process, and of the rules that guarantee its formal correctness or validity. But the object of all reasoning, of all science and philosophy in fact, is to arrive at a *certain* knowledge of *truth*; and, to secure this it is not enough that our reasoning processes be correct and valid formally, the judgments involved in them must furthermore be both true and certain. . . .

"Our next concern is to enquire how we reach true judgments especially those true *universal* judgments which constitute *scientific* knowledge. . . . This part of logical doctrine is variously described as applied logic, methodology and the science of logical method."

Dr. Coffey's book can be strongly recommended to those wishing to study this subject, and is, in my opinion, a better presentation of logic than any modern text-book, notwithstanding the fact that some portions of it will not be acceptable to anyone but a Catholic.

what way it was applicable to anything Mr. Pickard-Cambridge or myself had ever said or written. Indeed I think Dr. Schiller has rendered this discussion somewhat unreal and his method is hardly fair either to Mr. Pickard-Cambridge or to myself. The position briefly is this. Mr. Pickard-Cambridge and I are, in essentials, fully in agreement. Against us are two opponents, Dr. Mercier and Dr. Schiller, who disagree strikingly among themselves. The task of replying to Dr. Mercier on the question of the use of a universal in reasoning I have been fully content to leave to Mr. Pickard-Cambridge with whom on this matter I unreservedly identify myself and fully agree with the general trend of his argument. On the other hand, Dr. Schiller is concerned for the pragmatist philosophy, and attacks *in toto* the idea of formal validity. Dr. Schiller's standpoint is exceedingly puzzling to anyone not fully conversant with his views, consequently I have made it my special business to reply to him. Dr. Schiller, therefore, should address his remarks to me instead of commenting profusely on some one who confessedly does not understand him and who was dealing, very ably indeed, with something quite different. In his brief acknowledgment of Dr. Schiller, Mr. Pickard-Cambridge (I am sure he will excuse me for expressing a candid opinion) seems to me to have been trapped into a slight ambiguity. Dr. Schiller thereupon occupies eight pages of MIND in pointing out that the ambiguity is ambiguous and greatly puzzles both of us to discover exactly what his eight pages are supposed to prove. Perhaps I may be permitted slightly to amend one remark Mr. Pickard-Cambridge made (No. 102, p. 213) and to say that the argument A is next to B, B is next to C therefore A is next but one to C is *formally invalid*.[1] The statement may sometimes be true and sometimes false, but the conclusion is a *non-sequitur*. It seems to me that with this slight emendation Dr. Schiller's eight pages become entirely irrelevant, and that, so far as Mr. Pickard-Cambridge is concerned, no further reply is needed.

I will now deal somewhat more fully with the contention that "no reasoning, no strictly logical argument, is in itself a guarantee of material or empirical truth". On this point Dr. Schiller, Mr. Pickard-Cambridge and myself are in entire agreement. Mr. Pickard-Cambridge and I were both of opinion that it was one of the commonly accepted truisms of logicians. We are, moreover, both of us in agreement concerning the important distinction between the validity of a logical inference and the material truth of its application. As I have previously argued, the analogy of mathematics holds precisely. Dr. Schiller, however, contends that the difference is "that the mathematician recognises that there is a question of the *application* of pure mathematics to

[1] This question raised by Dr. Schiller about multiplicity of logical forms seems to me very simple and I am dealing with it in the appendix to the article.

physical reality, while the logician has not seen that there is an analogous question whether *any* logical form applies to *any* reality". The italicised *any* is somewhat ambiguous but I take it that Dr. Schiller means material truth. If I accepted his antithesis fully, the only possible comment would be: so much the worse for the logician, but the principle is not affected. As a matter of fact, however, neither part of Dr. Schiller's statement is more than partially true. The mathematician who is also a man of science is obliged to recognise the problem in a partial and halting manner because he so often finds himself at variance with facts if he fails to do so. The pure mathematician recognises the principle still less. But, as I have shown on several occasions, even the scientific mathematician recognises it only partially and intermittently. In consequence he is continually spinning cobwebs which the man of common sense has to sweep away. As instances of this I will only mention the nonsense written in the last generation about the dissipation of energy, and the scarcely more tolerable stuff written by present day exponents of the principle of relativity, and by mathematicians (and Dr. Schiller) about metageometry.

I fully expected to find Dr. Schiller wrong in his statement about logicians, indeed I have already shown that it does not apply to present day scholastic logic. With regard to the modern logician, on referring to a few works on logic, I find their philosophical basis so confused that I am bound to admit that Dr. Schiller's sweeping statement is not altogether unjust. Indeed, from a hurried and cursory glance through text-books on logic, neither Mr. Pickard-Cambridge nor myself have found a statement quite explicit and adequate.[1] At the same time the notion that no logical argument is in itself a guarantee of material truth is so familiar to me that I think it must be found somewhere in a clear philosophical statement. To the extent that I have not been anticipated, however, I must claim the discovery for myself,[2] and I can certainly claim the credit of stating the truth clearly and explicitly, and of pointing out that if it is so recognised the classification of material fallacies is immediately clarified, as is also that very tedious and absurd controversy on existential import. The main thesis I thought was common property and undisputed and merely took to myself the credit of stating it a little more logically than had been done before. I did not, therefore, attach much importance to that

[1] The best I have found up to the present have both been pointed out to me by Mr. Pickard-Cambridge. They are Carveth Reid, *Logic Deductive and Inductive*, p. 102, and Joseph, *Introduction to Logic*, p. 342. Neither is quite sufficiently clear and adequate to be worth quoting in full. A study of Jevons and Venn would probably give some relevant passages. Dr. Keynes (*Formal Logic*, p. 2) also recognises the principle. I agree, however, with Dr. Schiller that present day logicians do not observe it consistently.

[2] See "A Theory of Material Fallacies," *Proc. Aristotelian Society*, 1911-12, also MIND, January, 1912.

paper, especially as it was to me but a side-issue arising from previous investigations on the philosophy of applied mathematics. The only aspect on which I laid stress was the treatment of material fallacies. My own opinion of its value appeared to coincide exactly with that of other logicians, none of whom took any notice of it. It would appear, however, if Dr. Schiller's statement is correct, and I find myself unable to controvert it, that I have, so far as modern logic is concerned, made an important discovery. Academic logicians, therefore, it seems to me, in view of Dr. Schiller's statement, are now under an obligation to define their position and to say to what extent they agree or disagree. I, at least, have stated my position clearly.

From the philosophical point of view, which, I think we shall agree, is the one that really matters, it is important to point out to Dr. Schiller that with the full acceptance of my principle the greater part of his criticisms on formal logic, as apart from the vagaries of present-day logicians, are invalidated. There is, of course, room for discussion of the place and value of logic on grounds of utility, but none on grounds of principle. The meaning of formal validity is clear and unequivocal. Logic becomes a purely conceptual science like mathematics. The formal validity of a syllogism becomes precisely similar to that of the binomial theorem. The whole structure of inferential and syllogistic logic remains untouched. There is room also for forms of logical reasoning other than the syllogism, if once it is clearly recognised that their validity depends entirely on the absolute axiomatic truth of the universal (expressed or implied) on which they rest.

To conclude this discussion I will put to Dr. Schiller a metaphysical problem. It is his position that formal validity does not in fact exist. What then does he make of the rigidity of the reasoning process? Let us take as an example the instance he is himself so fond of quoting—euclidean geometry. We will put on one side the controversy concerning the nature of axioms in which both of us have from time to time taken part and concerning which our differences are at least intelligible. Let us concentrate on the process of deduction. There are differences of opinion concerning the kind of truth expressed by the postulates and axioms. But not even Dr. Schiller has doubted that, granting the postulates and axioms, the proposition that the three angles of a triangle are equal to two right angles inevitably follows. Why? No one knows better than Dr. Schiller that the euclidean concepts do not exist as material facts, and that empirically the proposition can be shown to be true only approximately. What then is the nature of our certainty of the *nexus* connecting the proposition and its ultimate premises? I will put the question, or a part of it, in a more striking manner. Let us assume the majority of the postulates and axioms and consider only the axiom of parallels. Granting the axiom of parallels, in Euclid's, Playfair's or any other form, there follows the proposition concerning the sum of the three angles of

a triangle. Modifying that axiom in the slightest, there follows a corresponding difference in the sum of the angles of the triangle. Empirically, both the axiom and the proposition can be verified approximately by actual measurement, in each case only approximately. Empirically, the verification is not sufficiently exact to enable us to deny definitely Riemann's or any other peculiar mathematical "space". But the axiom and the conclusion here labour under precisely the same limitations. Neither can be proved exactly by empirical measurement. Why therefore is it not possible to say that the axiom of parallels and Riemann's space may both be true at the same time, or that the truth of the axiom of parallels may coincide with the falsity of the triangle proposition. Both statements are intrinsically absurd, but neither can be disproved empirically. What then is the precise nature of the indisputable connexion between the euclidean axiom and the euclidean proposition? Dr. Schiller does not deny its existence, but how on his philosophical basis can it be explained? If we reject the obvious and traditional explanation that the series of inferences is an instance of absolute formal validity, which explanation is at least clear and explanatory, what alternative theory is possible?

H. S. SHELTON.

Appendix on Logical Forms.

I have previously stated that I regard the inference A is next to B, B is next to C, A is next but one to C, formally invalid. A word of explanation is desirable. It is, of course, possible by taking sufficient premises to obtain the conclusion, *e.g.*, from the premises:—

(1) A is next to B.
(2) B is next to C.
(3) A, B, C, are in the same linear series.
(4) (explanation) "next" refers to order only not to proximity,

there is no doubt that the conclusion A is next but one to B necessarily follows. But it would be absurd to call this a valid form because there is no recognisable form and the argument is complex. At the same time, if there is any sufficient object to be gained, it is possible to manufacture additional forms *ad infinitum*. The method is as follows: First obtain some axiom or universal which can be regarded as absolutely true. "Things that are equal to the same thing are equal to one another" will suit our purpose very well. Next translate that axiom into symbolic form:—

A is equal to B
C is equal to B
therefore A is equal to C.

It will be seen that the meaning is practically identical. Two things (A, C) which are equal to the same thing (B) are equal to

one another (A is equal to C). Thereupon, substitute anything you please for A, B, C. The argument is no more a syllogism than the *a fortiori*. There are five terms, etc. It is undoubtedly valid. It is also clearly an inference. The truth that A is equal to C is obtained mediately as a consequence of the first two propositions. Therefore in a sense it can be called a valid form. And in this sense there can be innumerable valid forms, or at least a very large number. The objection to creating so large a number is equally clear. Every such argument can be expressed as a syllogism, therefore they are unnecessary. Also they are unsafe, for this reason. The validity depends entirely on the assertion that the universal from which the form is derived is *absolutely true*. Otherwise the form is not even formally valid. It is therefore, I think, much better, as a rule, to state the argument in a syllogism and in so doing state the universal explicitly. We thus avoid a very inconvenient confusion of formal validity and material truth. Nevertheless it is as well to recognise that the multiplication of logical forms is in a sense possible. To this extent Mr. Pickard-Cambridge was right in splitting up the ambiguous argument into two or more. Dr. Schiller has shown the kind of criticism to which the process is open. Therefore I should prefer to state the conclusion that, while when the syllogistic form seems unusually strained there is no insuperable objection to creating a new form, there is at present no sufficient reason for so doing in view of the difficulty of ensuring that so great a multiplicitly of axioms are absolutely true. Moreover, it should be distinctly recognised that every such form definitely rests on the assertion of the truth of a universal. If the universal is not universally true the form is not absolutely valid, which is equivalent to saying it is invalid.

H. S. S.

P.S.—There are some points in this appendix which are, I think, new to modern logical theory and which cannot be dealt with in an appendix to a discussion. I hope to elaborate them more fully very shortly and will ask readers to regard this statement as a brief preliminary note.

WHAT DOES BERGSON MEAN BY PURE PERCEPTION?

MR. HARWARD in the April number, page 203, tells us that he finds it difficult to assign any precise meaning to a passage of *Matter and Memory* (pp. 26-30) in which Bergson considers "how conscious perception may be explained". I am one of those to whom this passage seems not only precise but luminous. I may be wrong both in my interpretation of Bergson and also in my own view so far as I find it expressed in this passage, but pending an authoritative reply, supposing M. Bergson feels drawn to offer one, it may be useful if I try and state what I understand the doctrine to be.

Bergson affirms that the objects of external perception are images. Images are not things in the common-sense meaning, neither are they matter in the scientific meaning. The in-itself-ness which forms part of the common-sense notion of a thing and of the postulated reality of physical science does not pertain to the image. Yet images are not in the mind nor projected from the mind; they exist where and when the mind perceives them. Images are not the whole reality and reality is not an aggregation of images. Reality is duration and images are a selection within, and a contraction of, duration. The activity which selects and contracts is memory. Without memory there would be no images; without images there would be no perception. In experience there is neither "pure" perception nor "pure" memory, the notion of each is theoretical and corresponds one to a notion of pure matter, the other to a notion of pure mind.

This theory of perception raises many philosophical problems and cannot be wholly dissociated from metaphysical theories of space and time and reality in general. Yet taken in itself it seems to me clear enough in its distinction from realist theories on the one hand which make perception "diaphanous," and present it as an external relation of awareness, the sole condition of which is the compresence of two objects, one of them a mind, in an absolute space at an absolute instant; and from idealist theories on the other hand which identify *esse* and *percipi*. Conscious percipients are "centres of indetermination"; conscious perception is their exercise of selection and contraction. Were there no selection, were we conscious of all the influences at every moment acting upon us, we should be theoretically perceiving everything, practically perceiving nothing. Consciousness would be indistinguishable from unconsciousness. Were there no contraction, there

would be no definite objects with distinct outlines. Were there neither selection nor contraction there would be no images.

Mr. Harward asks,—What does Bergson mean by "pure" perception? The answer is that Bergson is using a precise mathematical concept, the concept of limit. Take an instant of conscious life, suppose memory entirely suppressed, so that the instant yields only the immediate experience it actually contains, you are conceiving the limit of materiality. At the limit there is neither selection nor contraction and consequently no image. Pure perception exists then only in theory, but it performs the kind of practical service which a limiting concept performs in mathematics. There is an infinite approach to it but we can never reach it.

The theory of the selection of images appears to offer no special difficulty to Mr. Harward, at any rate if it does he lets it pass, but it is otherwise with the theory of the formation of the image by the contraction of successive moments. It seems to me that in regard to this theory Mr. Harward has simply failed to understand, and the evidence of his failure is his treatment of Bergson's illustration of the physical theory of the composition of the light-waves. Thus Mr. Harward takes the red rays as the instance of concrete perception and proceeds to pose this question. Is the "pure" perception of this concrete perception red, the image in the ordinary common-sense meaning? Or, is the "pure" perception one individual of the 451 billion vibrations which according to scientific theory are propagated in one second at the red end of the spectrum? The mere fact that he can pose such a question shows that he has missed the point. He supposes Bergson to be seriously propounding something essentially silly, and he does not appear to see that irrespective of its silliness, it convicts Bergson in the passage quoted, if Mr. Harward's view is accepted, of laxity and confusion just when he is presumably intent on mathematical precision. He quotes him as saying that every concrete perception (and therefore of course the perception of red) is a synthesis of an *infinity* of "pure perceptions," and then interprets this as meaning that there is a *finite* number of "pure perceptions," namely 451 billion, in the concrete perception red.

The scientific theory of colour is not adduced by Bergson as an instance of a synthesis of pure perceptions in a concrete perception, and the obstacle to experiencing a pure perception is not "Exner's $\frac{1}{500}$th of a second". It is an illustration of contraction, not an illustration, certainly not an instance, of pure perception. Surely it is obvious that even were we able to realise the conditions in which we could perceive the vibrations in the spectrum we should be as far off as we are now from a pure perception. The obstacle to the experience of pure perception is that the image (and a single vibration is an image) is formed by memory.

What then is Bergson's point in using this illustration? He

wants to explain tension. Take the case of red colour sensation. According to the physical theory the condition of this sensation is the propagation of 451 billion vibrations per second and the smallest part of a second in which I can distinguish sensations is the $\frac{1}{500}$th. Let us accept the figures. What then? Colour sensation depends physically on the number of these vibrations contracted into our psychical moment of duration. Vary the number and we vary the colour. Precisely, says Bergson, but is there not also another way in which we could attain the same result? Suppose we relax the psychical tension. Suppose that without the physical rhythm of the propagation altering at all our grasp on it is relaxed, so that our tension extends. Must we not suppose that the effect would be precisely the same? The colour would change and finally disappear with the approach to the limit of coincidence with pure vibrations.

The essence of the *explanation* Bergson offers of conscious perception is that the selection and contraction which determine the matter and form of the images are strictly relative to the actions which we are organised to perform and the performance of which constitutes our life cycle. To conscious percipients organised for other actions than ours, perception is different to ours, different in its matter and different in its form, even though we adopt the view of physical science that physical reality is identical for all percipients. What in each case constitutes the image is the selection and contraction which memory effects. By memory in this connexion is meant, not reminiscence but, the spiritual activity which prolongs the past into the present.

H. WILDON CARR.

VI.—CRITICAL NOTICES.

Logic as the Science of the Pure Concept. Translated from the Italian of BENEDETTO CROCE by DOUGLAS AINSLIE, B.A. (Oxon), M.R.A.S. Macmillan, 1917. Pp. xxxiii, 606. 14s. net.

CROCE's Logic was first published in its present form in 1909, and is now translated [1] from the third edition. An interesting preface, dated 1916, emphasises the essential point of his logical doctrine, I had almost said its essential paradox, that is, the identification of philosophy and history, and the rejection of metaphysics.

In attempting to appreciate this brilliant work, which no one I think can study without learning very much from it, I shall take

[1] *Note on the Translation.* — The translation is on the whole fairly serviceable, especially for anyone who has the original at hand to refer to in suspicious passages. The English student will be grateful for it, and I know how hard it is to avoid errors in translating. But besides actual mistakes, which, though serious, are not very numerous, there is a good deal of laxity. I do not suspect the translator's knowledge of Italian; it rather looks to me as if he did not appreciate the inconvenience of expressions that lack precision in a logical treatise. I feel bound to give a few instances, to indicate that the English reader, who can work with the Italian text at all, should always have it beside him in using the translation.

Not to speak of "Phœnician Araby" for "the Arabian Phœnix" on page 51, we find on page 142 "the logical deduction *of* (my italics) the figures of the syllogism which it (verbal Logic) makes *from* (my italics) a series of moods recognised as not conclusive". Of course the "of" and "from" are transposed by a confusion of "da" and "di," and the sentence is turned into nonsense. On page 160 "Caio è mortale" is turnèd into "Caius is d ad," and the sentence calmly continues "since it is not possible to affirm *that he is mortal* (correct translation, my italics) without some reason". On p. 176 the text runs "this formula (Something is) would no longer be an individual judgment, since . . . every individual determination of the universal would not have been excluded". Of course the meaning is "would have been excluded from it". "Ne" meaning "from it" has apparently been taken for a negative particle. The translation of "conoscenza" (rendered "acquaintance" in some passages) on pages 247 and 249 by "knowledge," which is also used for "sapere," is bewildering to anyone who has not the original before him. The headlines throughout the book do not give the information which is given by those in the original. If these are too long for the English page, they might easily have been modified. The index is not reproduced. As it is of proper names only, surely it would have been well not only to reproduce, but to enlarge it.

the simple course of discussing the two questions which have forced themselves as obvious upon my own mind, and the second of which in particular is at first sight hard to answer. They are these. What, to begin with, does Croce offer in the way of logical doctrine? And in the second place, why does he offer no more than this?

First then, I will try to summarise what he actually tells us about Logic.

(i.) The object of Logic is the "pure concept" ("concetto puro"). The word "concept" does not matter; perhaps "notion," with an echo of Hegel's usage, would have had a less subjective ring to the English ear. Of course we are not to think of conceptualism. The pure concept is the logical element by which, in a spiritual act of an *a priori* synthesis, intuition or presentation ("rappresentazione") passes into knowledge of the real. Such knowledge is embodied in the individual judgment, at once historical and philosophical. This "concept" is of the nature of a category. It has reality only in presentations, is implied in every presentation, but is exhausted in no number of these. It is the only true universal, and in its unity in distinctions—in such forms as beauty, truth, goodness—reality has its being. And Logic, strictly speaking, considers nothing else than this.

From it are sharply distinguished, as empirical and abstract concepts—pseudo-concepts or conceptual fictions—our ordinary class-notions of concrete things or of geometrical figures. The former are based on arbitrary groupings of presentations, and thus contain something of reality, but are not universal. To the latter no presentations correspond; they are not real, therefore, but universal, though only with a feigned universality, a universality without concreteness (369). Both are formations posterior to the pure concept; that is to say, the category is not generalised from experience, but is present in its genesis, and these common notions are formed from true individual judgments by classification and its kindred developments, enumeration and abstraction.

Thus the world of ordinary general notions or pseudo-concepts, with the methods instrumental to them—classification, enumeration, abstraction—and the judgments and sciences to which they give rise, the natural sciences and mathematics, are practical artifices not concerned with truth, and fall outside the province of Logic. The presence of necessity or implication working even in the classificatory or enumerative judgment seems wholly ignored or denied. Logic recognises as its object only the unity in distinction of those true concrete universals which live in all actual reality and are exhausted by none; and these are categories.

Then is Logic, for Croce as for Hegel, the deduction of the whole chain of categories as constituting the soul of reality? Not so. Logic deals only with the concept of the concept, the concept of logical thought; that is to say, with the system of judgment, concept, and syllogism, which is for him a single thing. He

recognises no general or total reality and so no general philosophy —no metaphysic—which could consider particular categories as steps in such a reality. Therefore Logic, the philosophy of philosophy, does not transcend its own limits as the philosophy of knowledge. The philosophy of philosophy is a section within philosophy; it is not in addition the philosophy of beauty or goodness. It is rather as if we had before us Hegel's logical system cut down to the "subjective logic". But of this again the greater part would be rejected by Croce's treatment.

(ii.) The "pure concept" has its only true form in the individual judgment, in which an intuition (presentation) is subject and a concept predicate. This is the same thing as the judgment of perception; and this again includes the historical judgment, which is at bottom a determination of a present intuition by a concept which qualifies it, since the past is lived in unity with the present. This judgment marks the passage from imagination or pure expression—language,[1] which is one with art—to the affirmation of reality. It is the fundamental fact for Logic, and is the only judgment that is complete and original.

For here we meet the paradox that history is philosophy; they are one and the same thing, though distinguishable by an abstraction of aspects. A complete philosophy would be nothing more nor less than a perfect history, though, as reality is history, neither can ever reach a full stop.

The explanation of this doctrine is most easily drawn from the note on page 327 in which Croce narrates its genesis. The point is, in a word, that history and philosophy are the only two forms of the spirit which are really concrete, and in the end he came to see that these two concretenesses could not but coincide. Originally he had brought history under the general heading of art, distinguishing it as dealing with reality and not with mere imagination; this, he says, was because he was sure that history was too concrete to be absorbed in natural science, that art was a serious thing, and not an amusement, and that there was no third theoretical form of spirit besides art and philosophy. When, then, he became further convinced that philosophy excludes abstractness (by the exclusion, as we have seen, of classificatory and abstract science from the purview of Logic), the conclusion stated above became necessary for him. Philosophy is the complete establishment and interpretation of individual fact as given in the perceptive, including the historical judgment, the only fundamental and original knowledge of reality.[2] And what is true in natural

[1] Language of course, for Croce, covers all forms and media of expression.

[2] *Cf.* Gilbert Murray, *Literature of Ancient Greece*, 122: "The search for knowledge in the widest sense, which the Ionian called *ἱστορίη*, and the Athenian, apparently, *φιλοσοφία*. We are apt to apply to the sixth century the terminology of the fourth, and to distinguish philosophy from history. But when Solon the philosopher went over much ground in search of knowledge (*φιλοσοφέων*), he was doing exactly the same thing

science, or rather, in nature, belongs to this; for it is false that nature has no history.

Thus there is no philosophy of history nor of nature, and no history of philosophy. The former would be interpretations on the top of interpretations; for true history is already the full interpretation of historical and natural fact. And the latter would mean new and superfluous facts on the top of the facts; for in knowing history we already know the history of philosophy, which is within it.

There is indeed a judgment of definition, *e.g.* "Virtue is the habit of moral actions," which might seem to be an alternative rendering of the concept. But it is not a true judgment; it has no real subject and predicate, no distinction of presentation and concept; and further, when fully replaced in its context, it becomes identical with the individual judgment.

The individual judgment is always existential. It is essentially a presentation determined by a concept, and so categorical. Existence, Croce says, is a predicate (173); but what he means is better stated in the phrase (177) "the subject is determined as existence, and for this very reason determined in a particular way," and *vice versa*. In short, the conceptual predicate is attached to the object of perception and thereby qualifies reality. About the qualification of the real by the imaginary he seems to me less sure in touch, and is, I think, inclined to say that the latter exists only as something *de facto* imagined, which hardly meets the point (169). It may, however, represent an existing *desire*. This is a suggestion full of interest to-day in connexion with Freudian ideas.

This account of the individual judgment as categorical seems very valuable, and is, as Croce notes (561), distinctively modern. What startles me is that his logic, so far as I can see, contains practically nothing else.

(iii.) The syllogism, for example, is very cursorily treated, once (122) as the thinking of the concept in its distinctions, and consequently as an act not differing in kind from concept and judgment, and presupposing both *ad infinitum;* and again (140), in a page and a half, where the structure of the figures is briefly mentioned, but described as resting on a distinction of subject and predicate, employed in a purely verbal and empirical manner. This treat-

as the historians Herodotus and Hecatoeus." So too Wallace, *Hegel's Philosophy of Mind*, xlvii.: "The theme of the Unity of History . . . is the theme of Hegelian philosophy". As I have referred to a historical point in Croce's favour, it may be only just to mention one that perhaps tells otherwise. Though he would not have his priority of art to philosophy construed as temporal, yet I am convinced by the reference to Vico (pp. 428 and 568) that Croce's theory is affected by the idea that poetry was the primitive utterance of mankind. An echo of this idea in Symonds' Renaissance is criticised by Professor Burnet (*Early Greek Philosophy*, p. 195) with reference to Greek Philosophy; and I think it fails to recognise the profound practicality of primitive mind, and the antiquity of inscriptions stating pure fact.

ment illustrates Croce's acute insight, which at the same time, I venture to think, owing to his rigid isolation of principles and impatience of detail, betrays him into onesidedness. Certainly it is important to realise the unity of the whole syllogism as a single notion or judgment; that it *is* just thinking out a concept under its distinctions, and that it is not a combination of three separate acts. This insight ranks highest in the theory, and it is a great thing to have it recognised. Still, even taking in the statement in another place, of the inter-connexion of universal particular and singular, we are not satisfied that logic has nothing more to tell us of the syllogism. We should like to know what it means to use a major premiss, and whether the consideration of the figures brings out any difference of principle in this respect. We should like to know whether the development of a single subject into its implications, which the syllogism shows us in one form, could not be more completely grasped in its concreteness if recognised in many other forms. We doubt whether we have quite got a logic before us, when we have really not a word on the theory of inference. What, for instance, is demonstration? Croce makes merry (51) at the expense of those who expect, in the phrase of Thrasymachus,[1] to have the argument inserted in their souls by main force. But all this ingenious acuteness assumes an air of evasion. Fewer pages would have sufficed to say an intelligent word on the difference, for example, between demonstration and subsumption. In this connexion, and also elsewhere in the volume, we find disparaging references to symbolic logic in its older and newer developments. I am hardly the person to whom its students would wish to entrust their defence; but I am bound to say this much, that regarded as the general science of implications it merits a philosophical consideration which the author declines to bestow upon it. In the treatment of it and of mathematics he seems to me simply to reproduce Hegel's position. But granting, what I fully recognise, the instructiveness of that position, would not Hegel, if he were here to-day, have had something new to say about, for instance, the recent mathematical theory of the infinite? It is hard on lovers of Hegel to see the fine old paragraphs simply reproduced (417, 592 note) as if they had in them no capacity of fresh application or development.

(iv.) A few more examples out of many may be given to illustrate the cavalier treatment of topics in the discussion of which essential logical problems ought to have presented themselves. The law of Identity and Contradiction is (p. 100, *cf.* p. 337) briefly mentioned and well interpreted, but is not expounded in its inherent connexion with the Law of the Uniformity of Nature, which latter is separated from Logic, and relegated to the region of the empirical concept, with the irrelevant verbal quip that reality is not uniform (338). The Law of Excluded Middle and the doctrine of the opposition of judgments are passed over in silence; and to this

[1] My expression.

omission I attribute some uncertainty in handling the problem of opposites and of negation, to which I shall recur. The doctrine of predicables, involving classification and definition by genus and species, is dismissed as a matter of caprice upon caprice (89) referring to empirical concepts, whereas true classification is only to be found in the re-entrant curve of the categories. Yet the distinction of property and accident raises the whole question of the contingent and the necessary, which stands broadly in the way of Croce's doctrine respecting history, philosophy, and reality. The 'inverse ratio' of extension to intension is mentioned in passing (84) as a self-evident consequence of the relation of the moments of the notion, apparently without an inkling of the profound implications of that problem for the theory of the concrete universal.

Part I. of the volume, I should explain, exhibits the logical doctrine proper, that is, the theory of the pure concept and the individual judgment. Part II. develops the thesis, stated in Part I., of the identity of history and philosophy, and that of the extrusion of natural science and mathematics from the province of philosophical knowledge. Part III. deals with the theory of error, chiefly as embodied in a certain cycle of philosophical confusions, alleged and estimated from the standpoint of Croce's system; and Part IV. is a historical retrospect of certain logical topics, and concludes with an important statement of the features on which Croce's Logic rests its claim to originality.

In all this the theses of Part I. are extended and expanded, but except in the treatment of error its logical content is not augmented.

I have noted the audacious paradox—the identity of history and philosophy—which forms, one may say, the content of this logical treatise; and also the restricted reference to those problems which constitute the substance of Logic as commonly understood. Does the explanation of these two characteristics rest, as we might expect, upon an underlying connexion between them? It seems clear that when you have set up one form of judgment as the central phenomenon you have excluded a great part of logical experience. This brings me to my second question:—

II. Why is there no more than this in Croce's Logic?

(i.) I believe that the answer is in principle pretty clear. It depends, I think, on a fundamental aspect of Croce's doctrine to which I have already referred. For him there is no general philosophy; and, accordingly, there is no total reality, including within it, as degrees approaching a unitary whole or perfect experience, the distinctions of the pure concept, beauty, truth, and the rest. He calls these indeed degrees of reality, but they are not degrees of approximation to the nature of any whole within which they fall. They do not take rank in virtue of a more or less of any common character. This striking feature of Croce's thought, which explains among other things his rejection of religion as a special recognition and experience, is rooted in a view to which he devotes

a chapter in Part I., but which he has expounded fully in his study of Hegel's philosophy.[1]

He points out that pairs of "opposite concepts," as he calls them—the term "opposite," I hold, has meaning only as applied to judgments—such as being and not-being, beauty and ugliness, truth and falsehood, have not, within each pair, the same relation which "distinct concepts," such as beauty, truth, and goodness, have to one another. The observation is plainly true and important, especially in the appreciation of Hegel's dialectic. The "opposites" are, I should say, unreconciled differences of the same subject. The "distincts" are reconciled by their assigned places in the systematic whole. The point is noted, in effect, by Hegel himself, and, of course, by students of his method.[2] The result, however, which Croce draws from it, is that whereas the dialectic movement, the mainspring of which is a contradiction in reality as determined by certain predicates, applies to the "opposites," each of which implies and ultimately overcomes its negation; yet it does not apply in the same way to the "distincts" (which Dr. Mackenzie has recently called the counterparts). Truth, for example, is not, like ugliness, the negative opposite of beauty, nor goodness, like falsehood, that of truth. And there springs from this again the all-important conclusion that in each of the "distincts"—the great linked aspects of the unique "pure concept"—there is no factor of defect such as in the pairs of opposites pushes on the one to realise its unity with and absorption of the other, as that beauty, for instance, is defective and a contradictory determination of reality, which has not overcome and assimilated ugliness. It is for this reason that for him there is in Logic no general criterion drawn from the nature of the whole reality, such as to make demands on the phases and stages of thought, criticising them as carrying contradiction within them in different degrees, and assigning them their rank according to their capacity and coherence as vehicles of truth. The linked unity of the concept—the notion—is taken as perfect in all its manifestations, and none of them has a defect such as to drive the mind forward to another as nearer the whole.[3] *A fortiori*, no dialectic progress can apply to the pseudo-concepts, the notions of natural science and mathematics (p. 101), which are regarded as purely arbitrary and practical in their motive and method of formation.

(ii.) This being so, Croce's attitude to the individual judgment is wholly devoid of criticism. It was well done, and, as he says, in the spirit of modern Logic (p. 561), to identify it with the categorical judgment in contrast to any mere connexion of words or combination of class-concepts. But the modern attitude to it has also

[1] *Saggio sullo Hegel*, 1913.

[2] See *e.g.* Mackenzie, *Elements of Constructive Philosophy*, p. 174.

[3] P. 103, *cf. Saggio sullo Hegel*, p. 65, where the absence of defect such as to set up contradiction within each distinct phase of the concept, *e.g.* within the experience of beauty, is explicitly and vigorously maintained

another side, which may be expressed by saying that every judgment, categorical in the sense of the individual judgment of narrative or perception, is necessarily false. There can hardly, it would be urged, be more bare and unreasoned conjunctions than those embodied in such individual judgments; there can hardly be concepts more abstract than the subjects of historical judgments isolated out of the vast concreteness and complication of historical reality. "Cæsar and Napoleon," he says (p. 203), "are as necessary as quality and becoming." Yes, if you give each of them his adequate context, explaining the necessary connexion. But what a context, and what a connexion! On page 67, where "the individual" is spoken of as "the situation of the universal spirit at a determinate instant" and is contrasted with the empirical concept of a Socrates, say, as we figure him to ourselves in common knowledge, the truth of the matter seems splendidly expressed. But I cannot reconcile this passage with the rest of the doctrine of individual judgment. Work out the latter, I should urge, in the light of page 67, and the individual judgment, as an adequate vehicle of reality is exploded and abolished.

The truth of the natural sciences is rightly ranked as less than ultimate, and as in a sense subservient to practice; but its aspect of necessity and relevance—the commensurateness of S with P—cannot be put out of court when we are applying to thought the general criterion of comprehensiveness and coherence.

It is by neglecting considerations like these and extruding from Logic all application of the general criterion of system that the science has been eviscerated of its normal content, and that a single class of judgments, significant but by no means ultimate, has been taken as coextensive with philosophy.

We see the result plainly in the special pleading which becomes necessary to account for the advance of the mind from one category to another. There is nothing, we saw it urged, defective or unsatisfactory in the lower category itself (p. 103, *cf. Saggio sullo Hegel*, 65); there is indeed no lower and no higher. The contradiction which causes the transition is a purely psychological contradiction, a fatigue, as it were, in the experiencing mind.

Hence there is no necessary error in the lower grades of truth, and as insufficient determination is thus not recognised as the principal factor in the adoption of false alternatives some positive vice is needed to account for it. Croce states so forcibly the true principle that every negation must have a positive ground, as to obscure the truth that after all its positive content must meet in the same world with the positive with which it clashes, or the two could not so clash and exclude one another. Such over-statement is his habit, I would almost say, his philosophy.

Thus, for him, you have in negation or in error a practical act, of no theoretical value, say, a lazy thoughtless utterance intended to gain the assent of fools. But when this is branded as false, what is added to it is the desire or command that a genuine serious

thought should take its place. Thus the lower truth is taken out of the world of truth and falsehood and no longer judged by its criterion, and so ceases to be, in itself, error. There is no error without intent to deceive (pp. 97, 395). Thus to point out the onesidedness of any experience, such as beauty or religion, can be regarded by him as treating it *qua* a lower form of truth and therefore *qua* a mere theoretical error, and as he believes that there is no such aspect of lower forms of truth, he infers, in the case of beauty, that there is no error or defect; in the case of religion, that there is no such experience, but in its place a mere perverse advocacy of an indolent philosophy, being positively in its ground or existence "an arbitrary attempt against truth, due to habit, feelings, and individual passions" (446); and that therefore in reality there is no such thing as religion.

No doubt Croce has done well to rule out of Logic many classifications and antitheses which are in truth, as he calls them, purely verbal. But, as it seems to me, the only way of becoming aware what is purely verbal and what is not, the only way of not falling a victim to the forms of expression, is not to try and reject all reference to them, but to survey and criticise the whole of them, assigning them their values by the result of the survey. When you have a mass of data, none of which are *prima facie* decisive, but which as a whole are the only evidence you possess—and this is the relation of expressive form to logical thought—the only possible course is the one I have indicated. It is the course which we inevitably follow in all rational treatment of experience. The decision as to what is trivial and may be rejected must come after the survey and criticism, and not before. Granted that language is not purely logical, and that its distinctions cannot be read off as they stand into logical features, yet the critical interpretation of language through the wide comparison of its uses remains the only key to thought. How else are we to enter into each other's minds or our own? For every form and problem which you omit to scrutinise, the universal of logical thought forfeits some nuance of concreteness and significance. And when we note the omission from the real world of such an experience as religion, simply because our logic has excluded the criterion which points to an inclusive reality, and if there is no inclusive reality there can be no attitude of our being towards such a reality, we see how the narrowing of Logic has impoverished the universal of life.

The fundamental novelties which Croce claims for his treatise in his concluding remarks, centre in the exclusion from Logic of the natural and mathematical sciences as atheoretical and practical, the denial of the applicability of the character of "opposites" to the "distinct concepts" or categories, the complete substitution of history for the sciences as furnishing the wealth and content of philosophy; and finally, the total rejection of formalist logic, that is, apparently, of every attempt to gather the nature of logical thought from its expression in language.

The whole system of the philosophy, with the Logic as implying it and implied in it, is a construction of wonderful ingenuity and much insight. The Logic seems to me beyond criticism in so far as it stands on the unity of reality and the existential character of the judgment. Only, although philosophy is indeed no more than the full interpretation of facts, yet this has many grades and aspects, and the fact given to perception is itself a very different thing from the underlying subject in which a complex of data is unified for inference, or the ultimate subject, for example, of a categorical judgment which does not deal with events. And so my final feeling is that Croce has achieved a successful and instructive adventure in welding together the extreme poles of the logical world, but that he has dropped out the systematic structure of the whole which lies between them, and consequently has left them, though attached to the same axis, yet irreducibly unreconciled with one another.

BERNARD BOSANQUET.

Mysticism and Logic, and Other Essays. By BERTRAND RUSSELL, M.A., F.R.S. Longmans, Green & Co. Pp. viii, 234.

THE essays in this collection have all appeared before either in journals or in published books, and several of them have been already reviewed in MIND on their original appearance. But some of them were difficult to procure; and Mr. Russell's *Philosophical Essays*, which contained several, is now out of print, and by some mistake, I believe, was never noticed in MIND. No excuse therefore is needed by Mr. Russell for republication, or by us for reviewing.

The book consists of ten essays of which the first five (*Mysticism and Logic, The Place of Science in a Liberal Education, A Free Man's Worship, The Study of Mathematics*, and *Mathematics and the Metaphysicians*) are comparatively popular, whilst the remainder (*Scientific Method in Philosophy, The Ultimate Constituents of Matter, The Relation of Sense-data to Physics, The Notion of Cause*, and *Knowledge by Acquaintance and Knowledge by Description*) are more technical. The essays on mathematical subjects have been brought up to date by additional notes; but Mr. Russell remarks in the preface that he is now less convinced than formerly of the objectivity of good and evil, and it is uncertain how far this change of view should modify the essays which deal with ethical questions.

I think it is fair to say that the keynote of the earlier papers is the demand for 'ethical neutrality' in philosophy. This is the pursuit of our investigations without reference to hopes and fears as to the destiny of ourselves or of our race. Ethical neutrality has been obtained in most branches of science (though I think we must

except some physiological and biological speculations), but it has hardly been reached by philosophers. I agree entirely with Mr. Russell about the importance and the rareness of ethical neutrality in philosophy. Our hopes, fears, and judgments of value (even supposing the latter to deal with a characteristic of things as objective as redness or squareness) seem to me to be only relevant in philosophy in one rather roundabout way. The way is this. Among the facts that the ethically neutral philosopher has to recognise is the somewhat strange one that the process of evolution has produced people with hopes and fears, and with the power of ignoring them and acting and speculating disinterestedly. Now this fact *may* be perfectly compatible with such a view of the universe as is held to be almost certainly true in the *Free Man's Worship*. On the other hand, it is by no means obvious to me that it is compatible with such a view. The philosopher who lacks ethical neutrality immediately jumps at this difficulty and fills in the gap in his knowledge with a more comfortable hypothesis than the mechanical theory. But an ethically neutral thinker, recognising that there is not the slightest necessity for causes to resemble their effects, will, I think, refuse to do this. The effect on him of considering those facts which Mr. Russell somewhat ignores in the *Free Man's Worship* will simply be to reduce his confidence in the adequacy of the mechanical theory; he will, however, frankly admit his ignorance at present as to how it ought to be modified or supplemented, and will not assume that the modification must be in accordance with our hopes or our judgments of what is good. As against every form, from the crudest to the subtlest, of what is called Ethical Idealism, I believe Mr. Russell to be absolutely right. Every such system involves at some point the logical fallacy of passing from what ought to be to what is; and the state of mind which makes a man slur over this fallacy seems to me a detestable intellectual vice whose effects will not be confined to his philosophy.

I must add, however, that, so far as I can see, it is not a breach of ethical neutrality for a philosopher or physiologist to introduce at some point the hypothesis that certain processes in nature are more akin to mind than a mere study of chemistry and physics would suggest. Mr. Russell seems to hold that the motive of such a thinker is always to make the universe more 'homely'. But mind, on the face of it, is a *vera causa* among others; and some processes in the evolution of species and even in the growth and adaptation of living bodies have a very strong appearance of something like human design. To take, purely as an hypothesis, the view that they really are due to something like mind is as scientific as to suppose that light is due to something like waves in the sea. The main objection to the hypothesis is not that it is assumed to flatter our hopes, but that it is so difficult to state it clearly and work out its consequences in detail that it can hardly be verified, refuted, or modified by experience.

Mr. Russell evidently sets great store by the essay on *A Free*

Man's Worship. I think we must admit that, even though the mechanical theory, which it assumes, needs modification, no modification will make the world a decent place unless it allows that some people at any rate survive the death of their bodies. Unless this be so all values produced on earth are destined to extinction sooner or later. Now I am quite sure that philosophy has nothing whatever to tell us about survival except by the illegitimate process of postulating that what would be very bad cannot be true. So, in the main, I am inclined to think that Mr. Russell's pessimism remains the most probable view, though I am slightly less certain than he for two reasons: (*a*) that I think it highly probable that the mechanical theory is not the whole truth, and do not know how much modification it may need; and (*b*) that, whilst fully recognising the almost insuperable difficulties, I think it possible that the progress of Psychical Research (which appears to me to be the only way of dealing scientifically with the question of survival) may necessitate a modification of that view about human destiny which is almost forced on us by most of the other sciences when taken by themselves. (I must add that with survival the world might be worse than without it, a fact which enthusiastic believers in immortality sometimes forget. On the mechanical theory we know the worst and can avoid it by suicide. But if we survive bodily death we may be doomed to become continually more wicked, stupid, and wretched, and yet be indestructible. Survival in fact is a *necessary*, but not a *sufficient* condition of decency in the universe. The alleged communications of the departed certainly do not suggest on the whole that they have improved in intellect or virtue. Hence things may be even worse than Russell suggests.)

So much then for the facts which the Free Man has to recognise; what of the attitude which Mr. Russell advises him to take up? Negatively, he is not to think that external nature or human institutions are better than they appear because they are stronger than he and can hurt his body. This is excellent advice against the cosmic snobbery of the nature-worshipper, and the political snobbery of the worshippers of our 'new idol' as Nietzsche termed the state. Again, Mr. Russell strongly insists, the Free Man will not spend his time shaking his fist at the universe, for this attitude of indignation is itself a kind of slavery. (We might add that to feel moral indignation at the inanimate world is ridiculous, since it is not susceptible of moral predicates, whilst to shake one's fist at God is a consolation which Mr. Russell's Free Man—in spite of the drama with which the essay begins—could not consistently enjoy.) When we come, however, to Mr. Russell's positive directions to the Free Man, I fail to see how they are connected with each other, or with the Free Man's view of the nature of reality. He is advised to moderate his desires for particular objects, to accept the indifference of nature to his ideals and 'turn his necessity to glorious gain' by viewing the life of man as a sublime and beautiful tragedy, and to be uniformly kind to others and not to judge them harshly.

The first and last of these maxims seem to me obviously sound, but to have very little connexion with the Free Man's views on human origin and destiny. No special view of the universe is needed to enable us to see that most things which most men and nations struggle to get are not worth crossing the road for. We have merely to observe that the people who do get them are not satisfied, and in general we could easily foresee that they would not be satisfied. Again, it is clearly my duty to be kind and helpful and not to judge harshly; but why is it *specially* my duty to be kind and tolerant to people when I know that they and I are the temporary results of a clash of atoms? You might perhaps say that a man will naturally be less inclined to judge his fellows harshly on this view because it is hardly reasonable to expect much of beings with such an origin and destiny as theirs. But this, I think, is a fallacy. What may reasonably be expected of people can only be determined from an empirical investigation of how people on the average act. If a clash of atoms can produce consciousness and moral action at all our utter ignorance of the details of the process precludes us from arguing deductively to a low rather than a high average of moral achievement. Hence the knowledge that Smith is the transitory result of a fortuitous concourse of atoms provides no special reason for excusing him if his actions fall below the average level attained by the consequents of other such concourses. The Free Man will of course be unwise to lose his temper with Smith, for this is slavery; but it would equally be slavery if Smith were an immortal spirit.

If nature be indifferent to our ideals we shall of course do well to accept the fact and make the best of it. But I fail to see how the long and foredoomed struggle of the human race against cold and the exhaustion of raw materials can give æsthetic satisfaction as a tragedy even to the most impartial spectator; at any rate I should think that the last few million acts will be merely dull and depressing. I doubt if a good tragedy could be made out of the struggles of starving sailors on a derelict ship. In fact a process may be painful and humanly disastrous without being in the artistic sense a tragedy, as when a workman falls into a vat of boiling nitric acid. It seems to me that to make a genuine tragedy we need a selection of incidents between man and man, not the whole course of man's struggle with nature. Is the Free Man allowed to select, or is he to contemplate so far as possible the whole process? Again is he supposed to remember in general his view of man and nature as a whole or only its pessimistic consequences? If the former, there will surely be no question of tragedy but only of the interplay of atoms according to natural laws. If the latter why stop at this amount of inconsistency, when it would be more cheerful to do as most scientists do, and forget both the theory and the consequences?

The essay which gives its title to the book is an attempt to estimate the functions of mystical insight and of detailed scientific investigation in the establishment of philosophical systems. Mr.

Russell thinks that both are necessary. According to him the main characteristics of mysticism are: (1) a belief in direct insight as against detailed analysis; (2) a denial of plurality; (3) a denial of the reality of time; (4) the belief that evil is in some sense an illusion. Mr. Russell holds that most probably mystical doctrines are invented afterwards to explain the feeling peculiar to the mystical experience. As doctrines he is inclined to think that they are mainly false, but that all contain a germ of truth which it is most important not to neglect. The first is right in so far as the function of reason is merely to mediate between intuitions. It is wrong when some special kind of intuition is held to give a revelation which is to be trusted apart from all criticism and comparison with other intuitions. There is here some excellent criticism of Bergson which appears in the *Lowell Lectures*. The denial of plurality, Mr. Russell regards as responsible for the logic of absolute idealism, and he holds that its origin in mysticism explains its total inability to deal with any of the other facts of life and science.

The denial of the reality of time is false as applied to the relation of before and after, but it is valuable as a criticism of the purely human insistence on the distinction between past, present, and future, a distinction which is of no importance to the universe at large, but depends on the fact that our desires work forwards (and, I would add, that our memories work backwards). As regards the fourth point, mysticism generally uses good in two senses; there is a purely human sense in which it has an opposite, but both predicates are within the realm of appearance, and there is another sense in which it has no opposite. In this sense it applies to reality alone, and to it as a whole. Mr. Russell seems in the main to accept this view, and to regard it as a valuable protest against using ethical arguments on philosophical questions. Running through these essays there seem to me to be three questions about good and evil which are not very clearly distinguished: (1) Are good and evil merely subjective? (The preface suggests that this is so.) (2) Is anyone sufficiently free from bias to be a fair judge of better and worse? (The story of the pigs and the Grand Augur in Essay VI., and the doubt as to whether amœbæ would consider that the course of evolution had been upward or downward are here in point.) (3) Are good and evil sufficiently fundamental categories to be dealt with by philosophy? (The argument that love and hatred are very similar types of complex from the philosophical point of view in spite of their entirely opposite ethical character seems to be concerned with this question.) It is clear that (2) and (3) might be answered negatively without necessitating an affirmative answer to (1), whilst the affirmation of (1) involves the denial of (3) and the irrelevance of (2). As regards (3) I seem to detect yet another possible confusion. We must distinguish between the properties of good as an abstract characteristic and the properties (if any) other than goodness which are common and peculiar to good things. The argument about love and hate

only proves that a good thing and a bad thing may be very similar in their other properties. It does not have any tendency to show that there might not be a science of pure ethics dealing simply with goodness in the abstract. At present such a science seems likely to be 'short and dry' as Kant said of formal logic; but we may be as mistaken here as Kant has proved to be there.

The rest of the 'popular' essays call for no special comment, and I pass to the more technical ones. The Herbert Spencer Lecture on *Scientific Method in Philosophy* has already been reviewed in MIND by Dr. Schiller. With its plea for ethical neutrality, patient analysis, and logical construction as the only hopeful method in philosophy I entirely agree, and the examples about space and the reality of the external world are completely opposite to Mr. Russell's thesis. The essay on the *Notion of Cause* was reviewed in this journal by me when it appeared in the Aristotelian Society's *Proceedings* for 1912-13. Essay VII. on the *Ultimate Constituents of Matter* is a very important one in connexion with Russell's views about physical objects which will be familiar to most readers of MIND from the *Lowell Lectures.*

In Russell's view the chief difficulties of realism in regard to the external world spring from three sources: (*a*) the belief that physical objects must be persistent; (*b*) the belief that space has only three dimensions; (*c*) the belief that an event can only have one cause. These beliefs create difficulties even after the more obvious confusions such as that between sense-data and sensations have been removed. For Russell the world consists of (i) minds; (ii) a six-dimensional manifold of sensibilia, each of which has probably only a very short duration. Most of these sensibilia have no direct spatial or temporal relations (such as exist between the sense-data cognised by a single mind) to each other. But most of them can be classified consistently according to two different schemes. (i) We can classify them into groups such that the members of any given group have direct temporal relations to each other, though members of the different groups have no direct temporal relations. Such groups are called 'biographies'. All the sense-data cognised by a single mind form a biography, but there are doubtless similar groups of sensibilia cognised by no one. The latter, Russell, with some humour, terms 'official biographies'. (ii) The other method is to classify together all sensibilia which are related by certain relations of similarity and continuity. These groups are what are meant by 'things,' their members are the 'states of things'. Sensibilia do not depend for their existence or nature on minds, but the members of one group may vary with those of another and particularly with those of the group which constitutes a human body. It is possible that some sensibilia (*e.g.*, dreams, etc.) are 'wild', *i.e.*, are members of a biography but are not members of a thing. By a logical construction we can regard groups of the second kind as being in a single three dimensional space with constructed spatial relations. This seems to me to be about the most hopeful theory

that I have yet seen about the physical world. No doubt it bristles with difficulties of detail, but I do not see why they should be insuperable. *E.g.*, I suppose the distinction between what would ordinarily be called an objective change—as where a thing breaks in two—and a subjective one—as where we push our eye aside and double our sense-data would be explained somewhat as follows. In an objective change there is a change in practically all the members of the thing, and therefore in practically all the biographies which contain members of the thing. In a subjective change only that member of the thing which is in a single biography changes. I do not see clearly at present how the theory is going to deal with mental images. These do not seem to be ordinary 'wild' sensibilia, for there seems to be a clear difference open to inspection between images and sense-data. I am indeed strongly inclined to think that my visual images are not in the same private space as my visual sense-data, and that even the colours and loudnesses of my images are not directly comparable with those of my sense-data. *E.g.*, I can hear a whistle and have an image of the sound, but it does not seem to me that the image and the sense-datum are at the same point in a single scale of loudness, but rather that they occupy correlated positions in two entirely separate scales. There is again the fact to be noted that I cannot have an image of a colour unless I have previously sensed either the same (or, on my view, the correlated) colour. This seems curious if images be not in some way mind-dependent, though of course it might be put in a form which only makes the image dependent on my body and my past sense-data.

The next essay on the *Relation of Sense-Data to Physics* is earlier in publication than the one just discussed, and we need not consider it in detail. I will therefore conclude with a few remarks on *Knowledge by Acquaintance and Knowledge by Description*. Mr. Russell says that he recognises, owing to Mr. Wittgenstein's criticism, that his theory of judgment needs some modification, but that the changes needed are not serious. I have not, unfortunately, had an opportunity of talking to Mr. Russell for the last three years or so, and therefore I do not know precisely what Wittgenstein's criticisms and the consequent modifications may be. But I will risk the following criticisms even though they prove to be quite out of date. It seems to me that Russell's theory of judgment, as offered, will only apply to judgments where we are acquainted with all the terms which the judgment verbally professes to be about. In my judgment that $3 > 2$ it is plausible to hold that what exists is a complex which I will write $J(M, 3, >, 2)$. Here M stands for my mind and J for the relation of judging. But now take my judgment that Julius Cæsar was assassinated, and suppose that I only knew Julius Cæsar by the description 'the man who was called *Julius Cæsar*'. The proposition that I judge, on Russell's analysis, becomes:—

$(\exists b)$: x is called *Julius Cæsar* . $\equiv_x$. $x = b$: b was assassinated.

Now on Russell's theory I must be acquainted with every term in my judgment. What then are the terms in my judgment when I judge that Cæsar was assassinated? The only ones that I can see are *Julius Cæsar*, calling, formal equivalence, identity, and assassination. It can hardly be said that x and b are terms with which I am acquainted, since they are variables and apparent ones at that. Again the terms which the relation of formal equivalence relates are none of the terms which I have mentioned, but are propositional functions taken as wholes and having these terms as constituents. It would seem then that propositional functions must be able to enter as wholes into the judgment complex, and that they cannot enter as separate terms and a non-relating relation as $3, >$, and 2 enter into $J(M, 3, >, 2)$ on Russell's view. We must then, I should suppose, be capable of being acquainted with propositional functions as well as with terms of the more ordinary kind. Further, for any complete theory of judgments ostensibly about objects known only by description we must know how the incomplete symbol $(\exists b)$ . . . is going to figure in the judgment complex. If Russell's theory of descriptions is to answer its purpose we must be able to know that $(\exists b) . \phi b$ without having to be acquainted with anything that actually does satisfy ϕb. Until these points are settled in detail it can hardly be said that the theory of judgment throws any light on judgments ostensibly about objects known only by description. And these are of course the commonest and most interesting kind of judgment.

There is just one other remark that I wish to make about descriptions. All descriptive propositions involve a formal equivalence of the kind $\phi x \equiv_x . x = b$. This equivalence is never or hardly ever guaranteed by logic. Logic will not assure us that x is called *Julius Cæsar* . $\equiv_x . x = b$, as it will assure us, *e.g.*, that

$$\alpha(\beta . x \epsilon \alpha .)_{x, \alpha, \beta} . x \epsilon \beta.$$

Now it seems to me very unfortunate that the same name—formal implications or equivalence—should be used to cover what are surely quite different relations. Nor is this difference merely a psychological or epistemological difference in the way in which we get to know the same kind of logical fact. For the one kind of implication depends on the logical structure of the related terms, whilst the other does not. This is no objection to the theory of descriptions, but that theory does seem to me to force the distinction, which of course occurs in numberless other places, specially on our notice.

I have harped in this review mainly on points of disagreement. This should not hide the fact that I am wholly in agreement with Mr. Russell's general attitude towards life and philosophy, and with his philosophical method. I only refrain from praise because praise from me to him would be impertinent. Those who agree with me in thinking that the Free Man can extract from the evils of human life a subtle comedy as well as a sublime tragedy will derive ex-

quisite entertainment from reading this book and noting its spirit, and then reflecting that the author was recently lectured publicly on elementary morality by a complacent spiritual descendant of the late Mr. Nupkins.

C. D. BROAD.

Perception, Physics, and Reality; an Enquiry into the Information that Physical Science can Supply about the Real. By C. D. BROAD, M.A., Fellow of Trinity College, Cambridge. Cambridge, University Press, 1914. Pp. xii, 388.

THIS book has a peculiar and unusual quality, in virtue of which it serves a purpose analogous to that which examiners are supposed to serve in education. It does not advance any fundamental novelties of its own, but it appraises, with extraordinary justice and impartiality and discrimination, the arguments that have been advanced by others on the topics with which it deals. Mr. G. E. Moore's *Refutation of Idealism* is awarded an Alpha-minus (*cf.* p. 177 *n.*); the rest of us receive such betas and gammas as we deserve, except Locke, who I think may be said to be ploughed.

Locke is the chief victim in the first chapter, "on the arguments against naïf realism independent of the causal theory of perception". There is a long discussion of Locke's two hands in lukewarm water, ending, apparently, with the conclusion that whatever *prima facie* case this experiment may seem to establish against realism can be avoided through the assumption that hands are warmed by being put in cold water and cooled by being put in hot water, or through various other less plausible assumptions.

Mr. Broad's general attitude is that of one who wishes to defend realism, but finds the task difficult. As he proceeds, the arguments against realism grow more and more formidable. At the end, he is left with only a certain degree of probability in favour of a view which is only a pale shadow of the robust realism of common sense. Accepting from Mr. Moore the importance of distinguishing between a perception and its immediate object, the problem for Mr. Broad is as to the relation of this immediate object to the 'real' in the physical world. His definition of 'real' is to be gathered from the following passage: "Whatever else may or may not exist, it is quite certain that what we perceive exists and has the qualities that it is perceived to have. The worst that can be said of it is that it is not also *real, i.e.* that it does not exist when it is not the object of someone's perception" (p. 3). That is to say, the 'real' is what does not exist only when it is perceived. Much might be said in criticism of this definition, but it is at any rate clear and definite. He formulates two questions immediately after giving this definition, namely (*a*) do objects of perception themselves continue to exist at times when they are not perceived? and (*b*) do things exist which are not perceived but are inferrible from

perceived objects and have some relation to these objects such as could be called 'correspondence' with them? In the main, the first chapter rejects (rightly as I think) such arguments against realism as are familiar from Locke and Berkeley. But the different visual appearances of a given thing from different places lead to the conclusion that touch is a sounder source of knowledge as to shape than sight. This conclusion is adhered to throughout the rest of the book. The ellipses of various eccentricities which are seen from various places in looking at a circle cannot, Mr. Broad thinks, be *all* real, not because such a view would be logically impossible, but because it would be so terribly complicated (p. 41).

I think that we have here the first effect of an undiscussed dogma which is embedded in Mr. Broad's conception of 'reality'. What makes Mr. Broad call unperceived objects 'real' is not the mere fact of their being unperceived, but the supposed fact that they persist. He seems, in fact, to work with the notion of substance,[1] with the belief that the physical world must consist of permanent entities with changing relations. I think the contrary view, that permanence is constructed, and is that of a temporal series of successive existents, makes the relation of the object of perception to physical reality much simpler. We can then hold that, although we do not perceive everything, all that we do perceive is 'real' in the only sense in which anything is 'real'. All the visual ellipses 'corresponding' to the one tactual circle are 'real' while we see them, and nothing that exists (so far as our evidence goes) persists for very long. This view is not more complicated than the view that denies 'reality' to the visual ellipses. For on Mr. Broad's view they exist, and must have their place in an inventory of the world; but on his view there is something else of a different kind, more 'real' than they are, whereas on the view that I should advocate there is nothing more 'real,' though there may be many things which we do not perceive.

There is a very good discussion (p. 45 ff.) of the reasons which make it impossible to know that such words as 'red' and 'green' have the same meaning to two different people, but possible to know that such words as 'agreement' and 'difference' have the same meaning. The point is very important, and I do not know of any author who has made it so well.

The second chapter is "On Causation; and on the arguments that have been used against causal laws". It begins by stating that it will assume the validity of arguments from probability, and of induction as a means of establishing probability. There is in the early part of the chapter a certain amount of discussion of somewhat familiar themes, such as whether a cause is a thing or an event, and whether a cause is to be interpreted in terms of activity or of regularity. Naturally the regularity view is adopted. Equally

[1] This notion is rejected on page 103, and is certainly not *intended* to be assumed anywhere. But I think it is 'real,' *i.e.* exists when Mr. Broad does not perceive it.

naturally, it is decided that transeunt causality is quite as possible as immanent causality (p. 105). The discussion on "causal laws and time" (p. 106 ff.) is to my mind unsatisfactory because it seems to assume the continuity (or at least the compactness) of change, not merely as applied to the world as a whole, but also as applied to small portions of the world. If, as I believe, whatever exists persists for a finite time (however small), the truth must be more like the modern physical theory of *quanta*. Continuity, like permanence and everything else that is mathematically convenient, will be a matter of logical construction. This, if it be the case, compels a somewhat new discussion of such questions as the temporal contiguity of cause and effect. Something like this view is discussed on page 114, but in connection with what I should regard as an unduly conventional theory of time and space.

It is often thought that, when an effect is complex, its cause must be equally complex. A sound, for example, has the characteristics of pitch, loudness, and quality. Must the cause of the sound which we hear have three corresponding characteristics? Mr. Broad shows that there is no ground for thinking so (p. 139). The point is important from its bearing on the possibility of mechanical explanation in general.

The conclusion of chapter ii. had better be given in Mr. Broad's own words, as it would be difficult to state it either more briefly or more clearly:—

"That every event has a cause means on our theory that to every true proposition asserting the occurrence of an event at any given time there is a number of true propositions asserting the occurrence of other events at different (and perhaps, to be in accord with tradition, we should add earlier) times such that relative to this set the probability of the event's occurrence is 1. This proposition does not seem to me self-evident, nor do I know of any means of proving it. At the same time it obviously cannot be disproved and it is advantageous to assume it as a methodological postulate" (p. 161).

I can find no criticism to make of this statement, given the author's apology as regards probability (p. x.). I feel less convinced as regards what we are told (p. 114) is an *à priori* truth, namely, "the law that a system that has been quiescent for a finite time can only be set in motion by a causal process transeunt to itself"; but in view of the fact that no instance of a quiescent system is known, the question is perhaps not of great importance.

Chapter iii., "On phenomenalism," discusses the views of Mach, defended, not by Mach's arguments, but by those much better ones which Mr. Broad would advance if the views were his. Phenomenalism is defined as the theory which "holds, not merely that the objects of all our perceptions exist only when they are perceived, but also that there are no permanent real things with laws of their own that cause these perceptions and in some measure resemble their objects" (p. 164). It is pointed out

(p. 165) that this theory is incompatible with the causal theory of perception, according to which our sense-organs are part causes of our perceptions. For if phenomenalism is true we have no eye except when some one sees it, and therefore what we see when we are not under observation cannot be caused by the structure of the eye. This is a perfectly irrefutable argument. It does not provide any ground against phenomenalism, but if phenomenalism were otherwise acceptible it would afford a ground against the causal theory. It does not *prove* that it is impossible to deduce phenomenalism from the causal theory, since there is no fallacy in using a false premiss for the purpose of proving its own falsehood. The one thing it does prove is that phenomenalism and the causal theory cannot both be true; and this is important, since those who believe either generally believe the other, and the two together (though both cannot be true) are far more plausible than either separately, though either separately may be true.

This chapter does not seem to me very satisfactory. "I think it is perfectly clear," says Mr. Broad, "that an absolutely pure phenomenalism that wishes to explain and anticipate our perceptions can be ruled out of court. We will suppose that it is allowed to assume present perceptions and those that it can remember. It is quite clear that with these alone there are no causal laws possible that will account for the perceptions we may expect to have anything like as well as the assumptions which science makes will do" (p. 168). This certainly *seems* true; but is it? I am troubled by an argument which needs to be tested by practice, but which meanwhile I will advance with due hesitation. My problem is: How can we ever obtain any evidence for a causal law except through perception? And, that being so, must not the unperceived elements in such a law be definable as functions of the perceived elements? And, in that case, do these functions serve any vital purpose except *as* functions of perceived elements, and is there any reason to suppose that they represent independent reals? It seems to me that a world sparsely dotted with perceived elements can be "filled out" in the same kind of way in which a descriptive space is filled out until it becomes projective. The elements added will be functions of the elements given, just as are the "ideal" points, lines, and planes that are added to a descriptive space in constructing a projective space from it. The assumption that the ideal elements "exist" is, it seems to me, theoretically otiose, and merely convenient as affording resting-places for our feeble logical imagination. I grant at once that undiluted phenomenalism cannot yield as well-filled a science of physics as we are accustomed to, but I contend that what would have to be omitted represents mere prejudice or guess-work, for which there is no shred of empirical evidence. If all this is true, it does not, of course, prove that phenomenalism is true, but only that it cannot be shown to be untrue, and that it is the most economical of all the theories that may be true. The prudent philosopher, it seems

to me, will no longer aim at finding one certainly true complete theory in any subject: he will be more likely to find that an infinite number of theories are compatible with all the data, and he will assert only the common part (if any) of all these theories. In the problem with which we are concerned at present, this common part, I suggest, is what is *positively* asserted by phenomenalism. I do not say this is certainly the case; I merely think it may be, and Mr. Broad has not shown that it is not.

Chapter iv., a very long chapter, is on "The causal theory of perception". This theory, to begin with, is described as "the view which is certainly held vaguely by educated common-sense that our perceptions have causes and that some relation is to be found between the nature of these causes and the reality of the objects perceived" (p. 187). He suggests (*ib.*) that this theory *may* be a will o' the wisp, but he certainly does not succeed in proving that it is. He distinguishes it from the "instrumental" theory, according to which our sense-organs under suitable circumstances are instruments for perceiving reality, while under other circumstances they lead us to illusion. This theory, after considerable argument, is criticised, mainly on the following ground:—

"Grant that there is illusion whether small or great and you must grant that the complex mechanism involved in perception can produce two entirely different results. Entirely different in one sense and yet on the other hand unfortunately very much alike. It is the combination of their extreme likeness and their utter difference that threatens to wreck the instrumental theory, and with it, the science of physics as ordinarily understood. When we perceive reality, if we ever do so, the effect of the whole process in the reality, the organ, the brain, and the mind is to establish a relation between the mind and the reality that we perceive. When we perceive appearance, the effect of much the same process in the organs and the brain is to produce, not a relation to something already existing, but a whole of object + relation to mind. Now two effects could hardly be more unlike than this. Yet on the other hand there is an immense likeness between them" (p. 240).

This leads up to the question: "Can you really believe that practically the same mechanism can produce such utterly different results?" Nevertheless Mr. Broad does not *entirely* accept the conclusion to which the argument points. He adheres to the view that in touch, at least, we become acquainted with primary qualities which resemble those of their causes—not, oddly enough, their immediate causes, but others far enough back to be also causes of the visual appearances of the "same" things. The scientific theory of the causation of our perceptions, he points out, "assumes that the remote causes of our perceptions resemble their objects not only in the general way that both have primary qualities, but also in the much more particular one that there is a general resemblance between the shape of the appearance and the shape of

the remote cause" (p. 245). The queerness of such an assumption is fully recognised, but nevertheless, with limitations, it is allowed to be reasonable as regards tactual shapes (see p. 262). The final statement is as follows :—

"Our conclusion, then, is that it is most probable that there is a real counterpart corresponding point for point to what is perceived in most (perhaps in all) the tactual perceptions that we have of figure, though doubtless more differentiated than the tactual objects themselves; and that events in this reality are the causes of our visual perceptions, according to laws which science, stating its position in terms of perceptible primaries, is able to discover" (p. 265).

For my part, I cannot believe that a conclusion of this sort can represent the truth of the matter in its simplest form. The whole theory seems to me unduly ingenious and complicated in its developments, too much *ad hoc*, and too destitute of a large simple structure. It reminds me of the successive epicycles by which the Ptolemaic astronomy was emended before it gave way to Copernicus. Whatever the truth may be about perception and reality, I feel convinced that, as in Copernican astronomy, the difficulty of discovering it lies in a difficulty of imagination at the beginning, not in subtleties at late stages of the development. Mr. Broad's book produces upon me the impression of listening to a long cross-examination of a plausible witness by a highly-skilled barrister, Mr. Broad himself fulfilling both rôles. At first the witness's story seems quite straightforward. Gradually little points are elicited, none of them fatal, but each requiring a more or less unplausible addition to the original evidence. At the end, though the story has not been actually refuted, we are left with an uneasy feeling that it is wrong from beginning to end. My own firm conviction is that all the conceptions traditionally employed—reality, perception, cause, matter, space, time, mind—need such radical overhauling that theories stated in terms of them can hardly be judged at all until they have been translated into new language and vitally transformed by the translation. But so long as the traditional conceptions remain unchanged, I do not see what better discussion is possible than that to be found in Mr. Broad's book.

The last chapter, on "The laws of mechanics," is less important than its predecessors. The author is entirely justified in his criticisms of the present reviewer's arguments in favour of absolute motion, which is neither logically necessary nor logically impossible, but on grounds of economy should not be employed in stating the laws of mechanics. The subject of Newtonian dynamics is hackneyed, and it is difficult to say anything very new or very interesting within the framework of the traditional conceptions. We could wish that Mr. Broad had given a more important position to the principle of relativity, instead of relegating it to an appendix. Moreover, even concerning Newtonian dynamics, there are things to be said which we should have wished to find. Take,

for example, the first law of motion. It may be a definition of equal times, or of all sorts of things. For my part, I should regard it as a definition (or a way of reaching a definition) of the "same" thing at different times. This cannot be obtained from continuity alone, as may be seen by considering a sensibly homogeneous fluid. But this topic is too large for the end of a review.

Mr. Broad's book preserves a uniform level of very high excellence. There is not one foolish word in it; everything is clear, definite, and well reasoned. But one could wish that he would apply his immense abilities to the invention of genuinely new theories, rather than to the fitting together of an extraordinarily ingenious mosaic of bits of old theories. His book is exceedingly useful as showing the best that can be done in that way; but I do not believe it is the most useful book he is capable of writing.

B. RUSSELL.

VII.—NEW BOOKS.

Groundwork of Logic. By J. Welton. London: W. B. Clive, University Tutorial Press, 1917. Pp. xi, 356.

Under the existing conditions in the academic world any attempt to write an introduction to logic must be a compromise—or rather a series of compromises—between the tradition as it has been shaped by many centuries of academic teaching and the actual facts of human thinking as they are revealed by psychology and by the cognitive successes of the sciences, and the most that can be hoped for is that every successive compromise will leave the case for the tradition a little weaker and the prospect of rational reconstruction a little stronger. But for a long time to come whoever undertakes to compile a compendious treatise on logic will not only have to decide upon what he will introduce and what omit, but also upon the attitude he will adopt towards the profound differences of expert opinion which exist as to the nature, function, and purpose of his science. Is he barely to state them, to hush them up, or to advertise them? There are obvious objections to each course. As, however, the professors of logic are not in general disposed to carry their logic to the bitter end of its 'logical conclusion,' they will naturally seek to negotiate a compromise on this issue also, and all but the most uncompromising will not expect a textbook of logic to be intellectually satisfying. They will be content if, while enabling examinees to answer the old type of questions, it exhibits a certain freshness in the choice of examples and the general re-hash of the materials, and provokes to further reflexion by leaving recognisable the contradictions which pervade the subject.

Such success as is possible within these limits Prof. Welton's *Groundwork of Logic* may certainly claim to have achieved. He has ventured to rearrange the traditional order of his subject so as to put 'induction' in its natural place before 'proof,' and shines in his illustrations, which are good, modern, and often topical. As might have been expected, he does not disavow the insight into how we think which he was one of the first and most conspicuous to display in *The Logical Bases of Education*. His accounts of the relations of judgment to beliefs, questions, commands, desires and purposes, of the choice of 'facts' (pp. 96, 103, 136) and the revision of 'laws' (pp. 104-105), of observation, experiment and hypothesis, are clear and excellent. He recognises the great logical importance of the notion of *relevance*, though more often than not under its objectivist disguise as the 'pertinent' or 'material,' which is misleading because it conceals that the relevant is always a *selection* for a human purpose from the totality of qualities which 'belong' to a subject. He reduces inductive 'proof' explicitly to probability (p. 218), and points out that probable conclusions are not devoid of *value* because they lack *validity* (p. 228).

On the other hand, he does not go further into this distinction, nor does he contemplate the possibility that *all* truths may have to be reduced to probabilities, when judged by the ideal of absolute demonstration. His account of 'validity' is nebulous, of 'form' obscure, and in dealing

with cause and effect, axioms, system, certainty and syllogistic proof, he simply follows the tradition. It is perhaps a merit that he makes no attempt to co-ordinate his two sets of doctrines, seeing that such an attempt would assuredly lead to open failure; but the results are not likely to impress intelligent beginners with the coherence of logical science. It is not merely that Prof. Welton is silent about 'Sidgwick's Ambiguity,' in the light of which the old claim that "if one accepts as true the premisses of a valid syllogism, one is bound in consistency to accept the conclusion" (p. 250), becomes plainly untenable, and that the charge of *Petitio* is inadequately answered by taking the major premiss as a 'law' (in a way which appears to involve some confusion between laws of nature and of the State on p. 259), without noticing the retort that this interpretation also begs the question (or affirms a tautology) when it assumes that the 'case' to which the 'law' is applied is a case in point;[1] what seems indefensible, on Prof. Welton's own showing, is that he should claim that the conclusion of a 'valid' syllogism is, in his sense, *proved*. For he has (rightly) denied that "all the applications of scientific laws must be known before the law can be stated" (p. 259), and admitted that empirical laws are tested, modified, rejected or established by "further comparison with fact of conclusions reached deductively" (p. 105). As, moreover, 'axiomatic' laws are not axioms if the facts disagree with them (*ibid.*), and "so in every case a universal judgment must agree with the facts or be rejected" (p. 106), it would seem to follow that if the conclusion anticipated by a deductive 'proof' does not in fact occur, a doubt is cast either on the truth of its premisses, or on the selection of the 'case': or otherwise, that *after* we have been led to expect an event by a demonstrated conclusion, we have yet to wait and see whether it comes true in actual fact. Which no doubt is the case; but is it not quite inconsistent with what is traditionally taught about the cogency of demonstration?

Similar, and equally unfounded, superstitions linger on in other places. Thus Prof. Welton clings to that sheer piece of logical pedantry the 'reciprocal relation of cause and effect,' without seeing that whatever is analysed out as a 'cause' may be investigated further, and will then become susceptible of further distinctions, which will turn the original 'cause' into a plurality, so that there can never be any actual point at which the convertibility of cause and effect can be assumed absolutely. He repeats (p. 232) that "strict proof is reached only when it is shown that no other explanation of the facts is admissible," without inquiring what is to happen to 'strict proof' when it is shown that all that can ever be shown is that no other explanation has yet occurred to any one. He can allege no reason for the belief that it is necessary that "a system of thought should have a solid foundation" (p. 95), and "should make sure that what it starts from is true" and that "the safest starting-point for a new system is the exact knowledge of facts" (*ibid.*). These dicta, if they mean anything, mean that it is not possible to argue from hypotheses, and to verify them subsequently by experience of the facts they have anticipated. And this of course is ludicrously untrue. Hypothetical premisses can be argued from just as easily as the most absolute certainties. Why, then, should logicians persist in stipulating that the experimental endeavour we call reasoning should start from what are known to be 'facts'? In 99 cases out of 100 the belief that we are starting from 'fact' proves to be grotesquely false; in the 100th the initial fact is transformed out of all recognition; in all cases our reasoning would proceed exactly as well if our hypothetical data were recognised as such,

[1] *Cf.* my *Formal Logic*, p. 207.

while we ourselves should probably be far readier to revise them if we had realised their true nature from the start. Thus a more correct logical analysis would be more favourable to scientific progress. Lastly, it would then become possible to give a complete account of verification, and to emphasise, instead of slurring over, the fact that it can never be a 'valid' process, because it always proceeds by 'affirming the consequent,' but that the right inference from the conclusion that '*no verified truth is valid*' is that *no* '*valid*' *proof is possible*. All these strictures, however, only mean that it passes the wit of man to turn logic into a plausible compromise, and in nowise dispute that Prof. Welton's book is a good work of its kind. It is, moreover, singularly free from misprints, though Prof. Poulton's name is misspelt on page 201.

F. C. S. SCHILLER.

Strength of Will. By E. BOYD BARRETT, S.J. Longmans, Green & Co. Pp. 263. 4s. 6d. net.

This book is written in a clear and entertaining manner, and will make good reading even for the amateur in psychology, if he is interested in the psychology of will and character. The author, already known for his researches in will psychology carried out at Louvain, planned courses of will training which consisted in the doing of some trivial act (*e.g.*, standing on a chair for ten minutes a day) for no other reason than that of demonstrating or exercising the power of the will. The points which emerge most clearly in the course of the experiments are that the experimenter feels a more complete control of himself, and, particularly, that there is a pleasure in experiencing this assertion of the will, in the idea of willing for the sake of willing.

Unfortunately, however, there is no proof given that these exercises did or can develop the power of willing in general. Not that we need question the possibility of a general development of will-power, if by any particular exercise a person is led to see what good can be attained by firmness and continuity in willing, or to have a greater self-respect through what he has accomplished by making an "effort of will".

Mr. Barrett's experiments, however, naturally cannot prove that this effect follows except in reference to his own case, and it seems to me likely that in many cases such exercises would fail, and that because of their very formality and unreality. Yet this formality is a point on which Mr. Barrett especially insists. It is essential, he says, that "there should be no ulterior interested object in the task, for if so, the primary object of will training will be lost sight of" (p. 138). But surely a similar exercise of the will may be got from doing (or avoiding)—partly for the sake of a new interest in cultivating the will—actions which we have longed to do (or avoid) but have been too weak to accomplish without this new added motive of developing or proving our will-power. Such a way would seem superior to Mr. Barrett's artificial methods in that we should realise more fully that such increased will-power was accomplishing useful purposes; and also in that, at the same time, a specific desirable habit is being set up or an undesirable one broken down. At the same time some general improvement of will is no doubt better secured when the idea of asserting or cultivating one's will is an additional motive of the action.

We can see the reasonableness of Mr. Barrett's urging that the exercises must not be too difficult at first and that they should progressively increase in difficulty; but it ought surely to be possible to fulfil this condition even with exercises of a really useful nature.

The main point in a general training of the will seems to be to secure reflection upon the desirability of self-control, or upon the possibility of effective volition, and this may be provided for without any such formal

exercises. In so far as such exercises are useful it would seem to be (even judging from Mr. Barrett's introspection) in repeatedly bringing before the mind the idea and ideal of the power of the will.

Thus while from the point of view of experimental psychology we may welcome Mr. Barrett's ingenuity in devising novel experiments, and the thoroughness of his introspective methods, as an educationist I should deplore his tendency towards extreme formalism. If "the element of practical advantage in a task would ruin it from the point of view of will development" then most people, including some men of the finest character and "strongest wills" ever known, have never had any will training! Further, the experiments themselves do not prove that there is any permanent effect upon the will-power of the experimenter—they can only indicate an increasing feeling of power at the time. Can we be sure there will be a permanent increase of power in doing things other than further psychological experiments of a similar type? Mr. Barrett admits that even after "retreats"—"spiritual exercises lasting four to eight days during which the will is worked up to a high state of perfection"—there may follow in some cases no strengthening of the will in everyday life. The present writer once tried the famous recommendation of William James for developing will-power, namely, to do something every day for no other reason than that one would rather not do it, a method which Mr. Barrett's experiments resemble in some respects. A most disagreeable task was chosen on a country holiday, namely, the picking up of slugs, the very sight of which was loathsome. As a result, I could trace only a lessening of the specific horror of touching slugs, but no signs of a general improvement of will-power.

To sum up, Mr. Barrett rests content with an insufficient analysis of will-power; he is content to use too general terms and to give too small a place to specific impulses and motives. I may add that the book will be of special value to those who are interested in formal religious exercises of the type already referred to, while the author's skill in devising experiments and especially in making introspective records of them, makes his work a useful contribution to experimental psychology.

C. W. VALENTINE.

The Principles of the Moral Empire. By KOJIRO SUGIMORI, Professor of Philosophy in the University of Waseda, Tokyo. London: University of London Press, 1917. Pp. 247.

Japan at the present moment occupies a unique and intensely interesting position in relation to European civilisation. She is in it, but not of it. Forced into close contact with it by the imperious demands of an imperialistic trade expansion, which has usually been a precursor of political conquest, she alone of Asiatic communities has survived the shock of the encounter without suffering disintegration. Thanks apparently to her happening to possess in the Samurai a hereditary nobility intelligent and resolute enough to lead her into new paths, she has been able not merely to copy, but really to adapt, and to assimilate the new into her social tissue without destroying the old. When the guns of Commodore Perry's fleet put this issue in its most brutal and urgent form, Japan soon perceived that she must abandon the secular seclusion perfected for her by Iyeyasu, and once more have a foreign policy. So she entered into the 'comity' of European nations, and has more than held her own in that den of thieves. But she has remained as alien in spirit, in her language, script, religion and institutions (she still has a monarch who rules, not merely by divine right, but by divine descent), as she is in race. Until now she has played a difficult game with astonishing skill, and she seems about to reap her due reward. She is now watching the European race

committing *hara kiri* on a cosmic scale, with all the admiration she was trained to bestow upon such displays, but withal waiting in a coolly calculating spirit for her opportunity to assume the leadership of Asia.

When a people has such prospects and ambitions it becomes important to ascertain with what mental equipment it is being furnished by its thinkers, especially as the exponents of Japanese thought for English readers are neither very numerous nor very trustworthy. Prof. Sugimori's book therefore may be welcomed as an authentic and valuable document for the interpretation of the present mind of Japan. So taken it reveals an abundance of European stimulus indeed, but by no means merely mechanical copying. An Oriental twist is given even to the hoariest of our philosophic platitudes, and Prof. Sugimori's views are continually eluding our conventional categories. His style does not always make his argument easy to follow, though it not infrequently shows the quaint raciness we have come to associate with Japanese English. But the aphoristic way in which his opinions are enunciated sometimes gives him a dogmatic air, and he should really learn to break up his argument into paragraphs, and not allow a monster to sprawl over twenty-one pages, like that on pp. 195-216. In his views, Prof. Sugimori is emphatically humane and progressive. He is essentially a personalist, who recognises no God but "the Supreme Value" (p. 241), and regards all social institutions as subsidiary to the development of personal morality. He is a free trader (p. 224 f.), but no democrat (p. 208)—unless democracy be interpreted as respect for personal value (p. 124), and wishes to restrict the State to the more mechanical social functions. He is sufficiently free from the bigotry of patriotism to deplore "the international anarchy" (pp. 138, 200), and to assure us that "even a pet dog is sometimes dearer to us than some of our compatriots" (p. 229). Altogether one feels that if views like Prof. Sugimori's guide the actions of Japan, the rest of the world need not greatly fear the probable extension of her power.

F. C. S. SCHILLER.

On the Threshold of the Unseen, An Examination of the Phenomena of Spiritualism and of the Evidence for Survival after Death. By Sir WILLIAM F. BARRETT, F.R.S. Second edition, revised. London: Kegan Paul, Trench, Trubner & Co., Ltd.; New York: E. P. Dutton & Co., 1917. Pp. xx, 336.

This book, of which the title sufficiently explains the subject, was largely written, Sir William Barrett tells us, in 1891, but it was published only in 1908, when the first edition was rapidly sold out. It has now been enlarged and brought up to date, so much so that experiments made in December, 1915, and in 1916 are described, and Dr. Crawford's book on *The Reality of Psychic Phenomena* (1916) and the 'Doris Fischer' Case of dissociated personality (1915-1917) are mentioned. It may thus stand as representative of the matured convictions of a distinguished man of science, who is also almost the last veteran of the generation of inquirers who founded the Society for Psychical Research. It gives as a whole an authoritative and readable account of the problems of psychical research, though its order of treatment is a little paradoxical. For whereas most writers have endeavoured to lead up to the more anomalous phenomena from those which impose less strain on ordinary powers of belief, Sir William starts (in 'Part II.') with 'the physical phenomena of spiritualism,' and only discusses the mildest form of the supernormal called 'telepathy' at the end, in 'Part VI.' If we agree here to concentrate criticism on the philosophic, as opposed to the scientific and religious, issues involved, we may note that the appendix on miracles is hardly adequate. But for this the theologians are no doubt largely to blame, seeing

that they have not been able to make up their minds about what they want to mean by a 'miracle'. It seems an overstatement to declare (p. 292) that "hypnotism and telepathy are almost as fully established as many of the accepted truths of science". For of 'telepathy,' at any rate, there is as yet no experimental control, and consequently the pragmatic test, which is the real basis of men's belief in scientific truth, can hardly be used. Like all discussion of open, and hotly contested, questions of a science in its 'nascent' form, the book ought to be of interest and value to logicians who endeavour to apprehend the real movement of thought.

F. C. S. SCHILLER.

A Standard Method of Testing Juvenile Mentality. By NORMAN J. MELVILLE. Lippencott Company, Philadelphia and London. Pp. 140.

A practical manual for use in connexion with the Binet Tests. Part I. includes a discussion of general procedure in collecting and interpreting data based upon practical experience with the tests, while Part II. gives a convenient arrangement of the tests with suggestions as to a uniform method of applying them. These suggestions should be useful especially for the inexperienced experimenter, though absolute uniformity in using such tests as Binet's is, of course, impossible.

C. W. V.

Grundlegung der Allgemeinen Kunstwissenschaft. Von Dr. EMIL UTITZ. Band I, Stuttgart, 1914. Pp. 304.

The author of this book warns off all those who want "fancy" writing and "geistschillernde Betrachtungen über Kunst". Quite truly he remarks, "nicht um Mysterien und Wunder handelt es sich mir, sondern um ernste und exakte wissenschaftliche Erkenntnis". In the first volume he deals with such topics as the problem of a general *Kunstwissenschaft*, the æsthetic experience (including a discussion of the notion of value and æsthetic value), the enjoyment of nature and the enjoyment of art, and the work and pleasure of artistic creation. The work is more particularly useful for its treatment of the problems which lie between pure æsthetics and the history and criticism of individual arts. The book, which is admirably printed, includes a dozen well selected full page illustrations.

C. W. V.

Received also :—

Studies in the History of Ideas, edited by the Department of Philosophy of Columbia University, Vol. I., New York, Columbia University Press, 1918, pp. 272.

Mrs. Northesk Wilson, *The Talk of the Hour, or The Explanation of the Human Rays*, London, Jarrold & Sons, pp. xv, 96.

Henry Bradford Smith, *A Primer of Logic*, Rulaski, Va., 1917, pp. 48.

Bernard Hart, M.D., *The Modern Treatment of Mental and Nervous Disorders*, Longmans, Green & Co., 1918, pp. 28.

Thomas Whittaker, *The Neo-Platonists:* a Study in the History of Hellenism, 2nd edition, Cambridge University Press, 1918, pp. xv, 318.

John I. Tookey, S.J., *An Elementary Handbook of Logic*, New York, Schwatz, Kirwin & Fauss, 1918, pp. xiv, 241.

R. W. Wenley, *The Life and Work of George Sylvester Morris*, New York, The Macmillan Co., 1917, pp. xv, 332.

Neurological Clinics: Exercises in the Diagnosis of Diseases of the Nervous System, edited by Joseph Collins, M.D., New York, Paul B. Hoeber, 1918, pp. 271.

VIII.—PHILOSOPHICAL PERIODICALS.

JOURNAL OF PHILOSOPHY, PSYCHOLOGY, AND SCIENTIFIC METHODS. xiv., 16. **T. L. Davis.** 'On Inductive Inference.' ["The only meaning which can be attached intelligently to the word *probable* is this—that the probable is that which would be true if we knew that our will to choose fairly among all possible samples was successful. The principle of induction derives its validity from the metaphysical assumption that there exists a collection of potential experiences each member of which is what it is absolutely."] **M. W. Calkins.** 'A Clue to Holt's Treatment of the Freudian Wish.' [He takes the self as the primary unit of his psychology, though he does not realise it.] xiv., 17. **F. C. S. Schiller.** 'Mr Bradley, Bain and Pragmatism.' [Criticises the claim that Bain anticipated pragmatic logic and was confuted by Bradley. It is shown that Bradley's version of 'Bain' is a "Circean transformation" of the actual Bain's theory of belief in *The Emotions and the Will*, and is neither authentic, nor consistent nonsense, that his criticisms are unsound and tainted with the formalist abstraction from meaning, and that not one of the essential features of pragmatic logic occurs in Bain, who was concerned not with the theory of judgment, but with the distinction between real and spurious beliefs, for which however he suggested a valuable test in the willingness to act on a belief.] **C. E. Ferrer** and **G. Rand.** 'A Note on the Needs and Uses of Energy Measurements for Work in Psychological Optics.' [On the difficulties of subjective measurement.] **E. C. Parsons.** 'The Teleological Delusion.' ["God's purpose, nature's purpose, Society's purpose—that is the course of teleology, of that science which appears to be most indispensable to human composure, perhaps to human happiness." "The supreme horror of the war lay in its assault on our sense of progress," but "I am unable to see how peace can be born of militarism or to differentiate between militarism and militarism".] xiv., 18. **A. H. Lloyd.** 'Pragmatism and Metaphysics.' ["Pragmatism, while possibly not satisfying any known metaphysician, is nevertheless really big with the metaphysical." . . . "it so nearly identifies experience with reality as to render a metaphysic gratuitous" . . . "involving as it does the union of ideality and practicality, or spirituality and real life, of values and instruments, it would change the present" and enter on "the creative life of reality".] **C. Pepper.** 'The Nature of Scientific Matter.' ["The matter of science is what science describes, the objects about which laws are made." These 'facts' must be rendered comparable with each other—by reduction to visual data.] **J. Dewey.** 'Duality and Dualism.' [Disclaims both epistemological monism and epistemological dualism, which is "only two monisms loosely stuck together," and doubles all difficulties. If it is to be labelled D.'s position is "empirical pluralism".] xiv., 19. **W. T. Bush.** 'Constructive Intelligence.' [An appreciative review of *Creative Intelligence* by Dewey and others.] **M. T. McClure.** 'Francis Bacon and the Modern Spirit.' [Finds in Bacon four criteria of modernity,

(NOTE.—Nos. xiv. 20-24 appeared in the July MIND.)

the cognate ideas of progress, control, utility, and responsibility.] xiv., 25. **R. W. Sellars.** 'The Status of Epistemology.' ['Critical realism' considers it as "the reflective science which studies the nature, conditions, and development of human knowledge in the light of the available facts. It begins with a reflective study of the individual's field of experience, his distinctions and views of knowledge, and passes gradually to an hypothesis which will best harmonise the known facts."] **F. J. E. Woodbridge.** 'Structure.' [(1) It is universal, (2) really a discovery, of an absolute kind, and (3) identifiable with metaphysical 'matter'.] **C. W. Cobb.** 'The First Antinomy of Kant.' [The proof of the thesis is charged with contradicting in its course its original assumption. For it is untrue that an infinite series cannot be completed, unless it has a beginning, which was denied.] xiv., 26. **W. M. Urban.** 'The Pragmatic Theory of Value: A Reply to Herbert W. Schneider.' [In xiv., 6; disputes the value of the pragmatic theory, accusing it of 'fundamental incoherence' on "the fundamental issue of 'value and existence,'" and declares that the specific situation must be abstracted from and that it is "both a duty and a right" to be "resolutely irrelevant" to the passing moment.] **H. W. Schneider.** 'The Values of Pragmatic Theory.' [Is a 'Rejoinder,' which enumerates as contributions to the theory of values made by pragmatism (1) a genuine *re*-consideration of the problem, (2) the conception that values are specific and cannot be studied *in abstracto*, (3) the analysis of the value situation, and (4) the critique of the metaphysical and theological separation of a world of fact and a world of value, of judgments of fact and judgments of value. As for philosophers who are 'resolutely irrelevant' to present interests, they are "a social nuisance and an irritant".]

"SCIENTIA" (RIVISTA DI SCIENZA). Series ii. Vol. xxiii. January, 1918. **G. Milhaud.** 'L'Œuvre de Descartes pendant l'hiver 1619-1620. 1ère Partie: La méthode et la mathesis.' [A most excellent attempt, guided by the *Discours* and by some probabilities, to describe the work which Descartes did in his famous 'stove'. Milhaud has shown, in the *Revue de Métaphysique* for 1916, that on the noted November 10, 1619, Descartes thought that he was in communication with God, and probably believed that He encouraged him in his intention of ceasing to learn from books and trying to raise by himself the building of human knowledge. For this purpose he chose a method to guide the mind in quest of truth in general, and the *Regulae* give, the details of this method. The *Regulae* date. from about 1628 (*cf.* Adam, *Œuvres de Descartes*, x., p. 486), and the *Discours* of 1637 expresses the essential part in some well-known rules. The first rule is opposed to the principle of authority, but also the aid of deductive logic is energetically refused: the *Regulae* insists on the primitive and almost exclusive part played by intuition in the acquirement of knowledge, and the aversion of Descartes for 'the pretensions of the dialecticians to dominate reason, to control the legitimacy of deductions, and to substitute themselves for natural light, for spontaneous intuitions' is even more strongly marked in the *Regulae* than in the *Discours*. At this point it is important to read the essay of Milhaud in the *Revue générale des Sciences* of 1916 on the first scientific discoveries made by Descartes in the March of 1619, since it shows that Descartes was then influenced above all things by his mathematical discoveries. The second rule is completed in the *Regulae:* Descartes requires that 'the decomposition of the difficulties to be resolved, or the objects to be known, should be pushed up to the simplest elements. . . . Such ele-

ments are seized directly and completely by the intuition.' The third rule shows the necessity of the order to be followed in reconstruction from these elements of more and more complex things. The *Regulae* are a very instructive commentary on the importance which Descartes attached to his 'enumeration or induction'. Descartes had in view researches of *all* possible kinds, and had no doubt that the processes which succeed so well in mathematics can lead men to universal knowledge. To read certain passages of the *Discours*, the chief utility of mathematics would seem to be to exercise the mind in good method, and 'mathematics would thus seem to be merely a kind of formal teaching for one who seeks the true method.' And this impression is so current that, when Descartes appeals to the "Analysis" of geometers, it is usually supposed that he has in view the manner of research and of demonstration consisting in first supposing the unknown to be known, and then proceeding to demonstrated or evident truths. Thus, Hamelin (*Système de Descartes*, p. 55) thinks that "Analysis" means with Descartes not a part of mathematics but the analytic method. . . . But for Descartes as for us it is certainly a part of mathematics itself which is meant, and not merely the logical processes which are used there.' As for the reason why Descartes chose analysis rather than, say, Euclidean geometry, the commentary on the fourth rule in the *Regulae* shows very clearly what Descartes requires of the ancient geometers like Pappus and the algebraists who follow the tradition of Diophantus (Adam and Tannery, x., p. 373). The ancients used quite naturally, and without making it known to us, an analysis in which Descartes sees what he calls 'mathesis' (*ibid.*, p. 376): that is, the science whose object is pure quantitative relations, and on which depend all those—arithmetic, geometry, astronomy, music, optics, mechanics, and many others—which study the quantities specially realised by means of numbers or concrete magnitudes. That is what, in the eyes of Descartes, is the merit of the analysis of the ancients and of algebra. They do not merely give an example of long chains of simple and easy reasons, but contain the beginning of the true method, the science of quantitative relations, abstraction being made of the various things in which they may be seen at work. For Descartes, it would simply be to follow the rules of his method to try to construct this science (mathesis, universal mathematics) by relying on the analysis of the ancients and the algebra of the moderns,—but freeing the first from the figures which encumber it and the second from complications of notation. In fact, 'this would be to go straight to the simplest things. But it would be also and above all else to give the edifice of universal science its firmest basis.' Sometimes it is difficult to see whether the method or the mathesis is meant in the long commentary on the fourth rule in the *Regulae*; we may almost say that the mathesis *is* the method. In any case the consideration of this universal mathematics is the first care of Descartes: 'perhaps this universal mathematics is less an application of the famous rules than the working of the method itself, manifesting itself both in its form and its matter, to constitute the first and fundamental basis of Cartesian science'. In the *Discours*, when Descartes spoke of 'lines' for representing relations and proportions in general, we might at first be misled into thinking that here was indicated the fundamental idea of analytic geometry. But in the Latin translation Descartes added the word *rectis* at the end of the word *lineis*, and thus showed clearly that he simply meant that length was chosen by him to represent, not merely a sum or a difference but also a product, a quotient, a square root, and so on (*cf.* the sixteenth rule in the *Regulae*).] **A. S. Eddington.** 'The Interior of a Star.' **A. Mieli.** 'Il periodo atomico moderno. Parte III^{a}: La risoluzione del problema.' **W. A. Phillips.** 'La question irlandaise.' **E. Benès.** 'La place des

Tchécoslovaques parmi les Slaves.' Book Reviews. Review of Reviews. French translations of Articles in English and Italian.—Series ii. Vol. xxiii. February, 1918. **G. Milhaud.** 'L'œuvre de Descartes pendant l'hiver 1619-1620. IIème Partie: Les premiers travaux d'Analyse et de Géométrie.' **A. C. D. Crommelin.** 'The Galactic Circle as a Plane of Reference for Star Places.' **U. Pierantoni.** 'I microrganismi fisiologici e la luminescenza degli animali.' **C. Vallaux** and **J. Brunhes.** 'Les éléments géographiques de la guerre.' **A. Struycken.** 'Nationalisme et internationalisme.' Book Reviews. Review of Reviews. French translations of articles in Italian and English. Vol. xxiii., March, 1918. **George Sarton.** 'Le nouvel Humanisme.' [The War has brought out clearly, even to people who could not see the fact before, that science must be given a larger place in education. The great defect in those who try to teach science lies in their neglect of literary studies, and thus we must *humanise* science. At the present time there is no such thing as 'scientific education'; for it is not humanised by a study of universal history. Programme for future education. An important article from one who has shown himself capable of much self-sacrifice in support of his ideas in Belgium before and after August, 1914.] **G. Castelnuovo.** 'Il calcolo delle probabilità e le scienze di osservazione.' **Frederick Soddy.** 'The Compounds and Mixtures into which the Chemical Elements have been resolved.' **F. Savorgnan.** 'Le problème de la population après la guerre.' **A. Meillet.** 'La situation linguistique en Russie et en Autriche-Hongrie.' Book Reviews. Review of Reviews. Chronicle. French translations of articles in Italian and English.

IX.—NOTE.

I see, on looking through my paper in MIND, N.S., No. 107, that, although I at first speak of 'Whitehead and Russell,' I later generally refer to pieces of notation contained in *Principia Mathematica* as 'Russell's'. I did not mean by this to ascribe them to Mr. Russell rather than to Dr. Whitehead. I have no idea which of the authors is responsible for any given part of the book, and I only used 'Russell' as an abbreviation for 'Russell and Whitehead'. I should be sorry indeed to appear unfair to Dr. Whitehead, and my only excuse is the extreme difficulty of putting a phrase like 'Russell and Whitehead' into the possessive in English. Perhaps Dr. Whitehead will provide me with a suitable notation for this purpose, and Mr. Russell will guarantee it to be 'ethically neutral'.

C. D. BROAD.

Cambridge University Press

The Neo-Platonists. A Study in the History of Hellenism. By THOMAS WHITTAKER. Second edition, with a Supplement on the Commentaries of Proclus, Demy 8vo. 12s net.

Slight alterations only have been made in the text and notes of the book as it appeared in 1901, but the Appendix on the outlying subject of Gnosticism has, in view of recent research, been re-written, and in the Supplement on the Commentaries of Proclus, which is the feature of the new edition, a more circumstantial account of the Athenian period of Neo-Platonism is given. The book thus receives the completion which the author felt was desirable, and it is his hope that he has been able to set before the reader an account of the principal commentaries, bringing out their distinctive features and the new developments by which its finished form was given to the great system of philosophy initiated by Plotinus two centuries earlier.

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